

INJ. PUMP CALIBRATION DATA

ENGINE MODEL GD320, GD410

INJ. Pump Ass'y No. 104135 — 1000 (NP — PFR1KX60/1NP1)

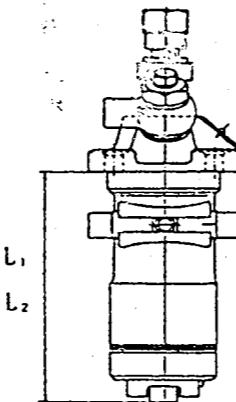
BOSCH No. 9 443 610 061
 DKKC No. 104135 — 1000
 Date: 10, April, 1989
 Company: HONDA
 No. 16300-ZG3-003

1. Test Conditions:

Nozzle & Nozzle Holder Ass'y No. : 105780 — 8190
 Nozzle No. : 105780 — 0060 (Bosch Type No. DN0SD1510)
 Nozzle Holder No. : 105780 — 2150
 Nozzle Opening Press. : 133 ± 3 Kg/cm² Transfer Pump Press. : 0.5 Kg/cm²
 Injection Pipe No. : 157805 — 3320
 Inner Dia. 2 mm × Outer Dia. 6 mm — Length 600 mm
 Test Oil : ISO4113 or SAE Standard Test Oil (SAE J967d) Oil Temp. : 35^{±10} °C
 Cam Profile : PFK — T — 00 (Tangential Cam, Cam Lift 7 mm, Base Circle φ 28)

2. Injection Timing:

PRE-STROKE : 3.2 ± 0.05 mm
 L₁ (Port Closing Dimension) : 72.8 ± 0.05 mm
 L₂ (Mounting Dimension) : 76.0 ± 0.05 mm



3. Injection Quantity:

Rod Position (mm)	Pump Speed (r.p.m)	Injection Q'ty (cc/1000 strokes)	Max. var bet. cyl (%)	Fixed	Remarks
10.7 ± 1.0	1800	24.1 ~ 25.9		Rod	Basic

() = Reference value

4. Control Rod Sliding Resistance:

Pump Speed (r.p.m)	Sliding Resistance (g)
0	Below 50
200	Below 30
1,000	Below 20

INJ. PUMP CALIBRATION DATA

TEST CIL:
ISO 4113 or
SAE J967d

ENGINE MODEL : NEW HA

BOSCH No. 9 460 610 339
DKKC No. 104740-0333
Date : 10, April 1989 [0]
Company : MAZDA
No. SE55 13 800A

Injection pump No.: 104640-0353 [NP-VE4/10F1900RNP281]
Pump rotation : Clockwise-viewed from drive side

For Test Condition see
Microfiche No. WP-210 (N-16)

1. Test Conditions

1-1 Nozzle : 105780-0000 (NP-DN12SD12T)	1-4 Injection pipe : 2 x 3 x 840 mm
1-2 Nozzle holder : 105780-2080 (EF8511/9)	1-5 Fuel oil temperature : 45 ^{±5} °C
1-3 Nozzle opening pressure : 150 ^{±5} kg/cm ²	1-6 Supply pump pressure : 0.2 kg/cm ²

2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1 Timing device travel		1,500	5.0 ~ 5.4 (mm)		
2-2 Supply pump pressure		1,500	5.7 ~ 6.3 (kg/cm ²)		
2-3 Full load delivery		1,000	53.1 ~ 54.1 (cc/1,000st)		3.5
2-4 Idle speed regulation		350	(cc/1,000st)		
2-5 Start		100	Above 78.0 (cc/1,000st)		2.5
2-6 Full-load speed regulation		2,100	19.1 ~ 25.1 (cc/1,000st)		5.5
2-7					
2-8					
2-9					

3. Test Specifications				
3-1 Timing device	N = rpm mm	1,000 1.6 ~ 2.8	1,500 4.9 ~ 5.5	1,900 7.0 ~ 8.2
3-2 Supply pump	N = rpm kg/cm ²	500 2.3 ~ 2.9	1,500 5.7 ~ 6.3	1,900 7.1 ~ 7.7
3-3 Overflow delivery	N = rpm cc/10s	1,000 53.0 ~ 97.0		

3-4 Fuel injection quantities				
Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
Max. speed	1,000	52.6 ~ 54.6		
	500	45.6 ~ 49.6		
	1,500	50.3 ~ 54.3		
	1,900	46.4 ~ 50.4		
	2,100	19.1 ~ 25.1		
	2,200	Below 6.0		
Switch OFF Magnet valve	350	0		
Idling	350			
	Below 620	10.8 ~ 14.8 0		
3-5 Solenoid	Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V			

4. Dimensions		
K	3.2 ~ 3.4	mm
KF	5.7 ~ 5.9	mm
MS	1.7 ~ 1.9	mm
BCS	—	mm
Pre-stroke	0.18 ~ 0.22	mm
Control lever angle		
α	18.0° ~ 22.0°	deg
A	35.9 ~ 38.6	mm
β	33.0° ~ 43.0°	deg
B	10.2 ~ 13.9	mm
γ	—	deg
C	—	mm



DIESEL KIKI CO., LTD.

Service Department

3-6-7 SHIBUYA, SHIBUYA-KU, TOKYO 150, JAPAN
Tel. (03)5485-4135 · Fax: (03)797-6069

INJ. PUMP CALIBRATION DATA

ENGINE MODEL : 4FC1-T

TEST OIL:

IS 0 4113 or

SAE J967d

Injection pump No.: 104640-1730 [NP-VE4/10F2250RNP272]

Pump rotation : Clockwise-viewed from drive side

BOSCH No. 9 460 610 354 1/2

DKKC No. 104740-1750

Date : 10, April 1989 0

Company : ISUZU

No. 894362 0790

For Test Condition see
Microfiche No. WP-210 (N-16)

O Note

- After adjustment of full load fuel injection quantity (1,250 rpm, 46.0 ~ 47.0 cc/1,000st), set the boost pressure at 266 mmHg or 0.36 kg/cm², and at a pump speed of 900 rpm adjust the fuel injection quantity using the BCS spring set screw.

1. Test Conditions

1-1 Nozzle : 105780-0000 (NP-DN12SD12T)	1-4 Injection pipe : 2 x 6 x 840 mm
1-2 Nozzle holder : 105780-2080 (EF8511/9)	1-5 Fuel oil temperature : 45 ^{±5} °C
1-3 Nozzle opening pressure : 150 ^{±5} kg/cm ²	1-6 Supply pump pressure : 0.2 kg/cm ²

2. Setting		Pump speed (rpm)	Settings		Charge air press (mmHg)	Difference in delivery (cc)
2-1	Timing device travel	1,250	2.7 ~ 3.1	(mm)	0	
2-2	Supply pump pressure	1,250	4.3 ~ 4.7	(kg/cm ²)	0	
2-3	Full load delivery	1,250	46.0 ~ 47.0	(cc/1,000st)	470 ~ 490	4.0
2-4	Full load delivery	900	38.5 ~ 39.5	(cc/1,000st)	256 ~ 276	3.0
2-5	Idle speed regulation	330	9.6 ~ 13.6	(cc/1,000st)	0	2.0
2-6	Start	100	50.0 ~ 70.0	(cc/1,000st)	0	
2-7	Full-load speed regulation	2,600	18.0 ~ 24.0	(cc/1,000st)	470 ~ 490	6.5
2-8						
2-9						

3. Test Specifications

3-1 Timing device	N = rpm mm	610 ~ 810 0.5	900 0.8 ~ 1.8	1,250 2.6 ~ 3.2	2,275 7.0 ~ 7.8
3-2 Supply pump	N = rpm kg/cm ²	600 2.6 ~ 3.2	1,250 4.3 ~ 4.7		2,250 7.1 ~ 7.7
3-3 Overflow delivery	N = rpm cc/10s		1,250 45.0 ~ 88.0		

3-4 Fuel injection quantities

Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
Max. speed	1,250	45.5 ~ 47.5	470 ~ 490	
	1,250	28.4 ~ 33.4	0	
	600	28.2 ~ 32.2	0	
	900	38.0 ~ 40.0	256 ~ 276	
	2,250	35.4 ~ 40.4	470 ~ 490	
	2,600	17.5 ~ 24.5	470 ~ 490	
	2,850	Below 5.0	470 ~ 490	
Switch OFF Magnet valve	330	0		
Idling	330 420	9.6 ~ 13.6 Below 3.0	0 0	

3-5 Solenoid Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V

4. Dimensions

K	3.2 ~ 3.4 mm
KF	5.7 ~ 5.9 mm
MS	1.1 ~ 1.3 mm
BCS	4.5 ~ 4.7 mm
Pre-stroke	— mm
Control lever angle	
α	-24.5 ~ -16.5 deg
A	10.1 ~ 12.7 mm
β	38.0 ~ 48.0 deg
B	12.2 ~ 15.5 mm
γ	— deg
C	— mm

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INJ. PUMP CALIBRATION DATA

TEST OIL:
ISO 4113 or
SAE J967d

ENGINE MODEL : SD25

BOSCH No. 9 460 610 337

DKKC No. 104740-4733

Date : 10, April 1989 [0]

Company : NISSAN DIESEL

No. 16700 10H04

For Test Condition see
Microfiche No. WP-210 (N-16)

1. Test Conditions

1-1 Nozzle : 105780-0000 (NP-DN12SD12T)	1-4 Injection pipe : 2 x 6 x 840 mm
1-2 Nozzle holder : 105780-2080 (EF8511/9)	1-5 Fuel oil temperature : 45 ^{±5} °C
1-3 Nozzle opening pressure : 150 ^{±5} kg/cm ²	1-6 Supply pump pressure : 0.2 kg/cm ²

2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1 Timing device travel		900	1.7 ~ 2.1 (mm)		
2-2 Supply pump pressure		900	4.1 ~ 4.5 (kg/cm ²)		
2-3 Full load delivery		900	36.7 ~ 37.7 (cc/1,000st)		3.5
2-4 Full load delivery			(cc/1,000st)		
2-5 Idle speed regulation		350	8.0 ~ 12.0 (cc/1,000st)		3.0
2-6 Start		100	45.0 ~ 80.0 (cc/1,000st)		
2-7 Full-load speed regulation		1,400	9.1 ~ 15.1 (cc/1,000st)	3.5	
2-8					
2-9					

3. Test Specifications					
3-1 Timing device	N = rpm mm	900 1.6 ~ 2.2	1,200 2.7 ~ 3.9	1,450 3.5 ~ 4.7	
3-2 Supply pump	N = rpm kg/cm ²	900 4.0 ~ 4.6	1,200 4.8 ~ 5.4		
3-3 Overflow delivery	N = rpm cc/10s	900 42.0 ~ 85.0			

3-4 Fuel injection quantities					
Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)	
Max. speed	900	36.2 ~ 38.2			
	600	33.2 ~ 37.2			
	1,200	38.0 ~ 42.2			
	1,400	8.6 ~ 15.6			
	1,500	Below 3.0			
Switch OFF Magnet valve	350	0 ^{±5}			
Idling	350 400	8.0 ~ 12.0 Below 3.0			
3-5 Solenoid	Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V				

4. Dimensions

K	3.2 ~ 3.4	mm
KF	5.7 ~ 5.9	mm
MS	0.9 ~ 1.1	mm
BCS	—	mm
Pre-stroke	0.26 ~ 0.30	mm
Control lever angle		
α	21° ~ 29°	deg
A	4.0 ~ 9.2	mm
β	37° ~ 47°	deg
B	10.7 ~ 14.8	mm
γ	—	deg
C	—	mm



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Service Department

3-6-7 SHIBUYA, SHIBUYA-KU, TOKYO 150, JAPAN
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INJ. PUMP CALIBRATION DATA

TEST OIL:
ISO 4113 or
SAE J967d

ENGINE MODEL : TD27-T

Injection pump No.: 104640-7112 [NP-VE4/10F2050RNP750]
Pump rotation : Clockwise-viewed from drive side

BOSCH No. 9 460 610 350 1/2
DKC No. 104740-7112
Date : 10, April 1989
Company : NISSAN DIESEL
No. 16700 80G07

For Test Condition see
Microfiche No. WP-210 (N-16)

1. Test Conditions

1-1	Nozzle : 105/80-0000 (NP-DN12SD12T)	1-4	Injection pipe : 2 x 6 x 840 mm
1-2	Nozzle holder : 105780-2080 (EF8511/9)	1-5	Fuel oil temperature : 45 ^{±5} °C
1-3	Nozzle opening pressure : 150 ^{±5} kg/cm ²	1-6	Supply pump pressure : 0.2 kg/cm ²

2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1	Timing device travel	1,100	S/T ON: 4.0 ~ 4.8 (mm) S/T OFF: 2.1 ~ 2.5 (mm)	410 ~ 430 410 ~ 430 410 ~ 430 410 ~ 430	
2-2	Supply pump pressure	1,100	S/T ON: 5.6 ~ 6.4 (kg/cm ²) S/T OFF: 4.0 ~ 4.6 (kg/cm ²)		
2-3	Full load delivery	1,100	61.8 ~ 62.8 (cc/1,000st)	410 ~ 430	3.0
2-4	Full load delivery	850	58.4 ~ 59.4 (cc/1,000st)	240 ~ 260	
2-5	Idle speed regulation	375	6.4 ~ 10.4 (cc/1,000st)	0	2.0
2-6	Start	100	45.0 ~ 80.0 (cc/1,000st)	0	
2-7	Full-load speed regulation	2,250	40.8 ~ 44.8 (cc/1,000st)	410 ~ 430	
2-8					
2-9					

S/T: Solenoid timer

3. Test Specifications		Solenoid Timer	ON	OFF		
3-1	Timing device	N = rpm mm	1,100 3.9 ~ 4.9	1,100 2.0 ~ 2.6	1,700 4.2 ~ 5.2	2,500 6.4 ~ 7.4
3-2	Supply pump	N = rpm kg/cm ²	1,100 5.6 ~ 6.4	1,700 7.4 ~ 8.2	1,100 4.0 ~ 4.6	1,700 5.8 ~ 6.4
3-3	Overflow delivery	N = rpm cc/10s	1,100 43.0 ~ 87.0	1,100 (without O-ring) 60 ~ 103		

3-4 Fuel injection quantities					
Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)	
Max. speed	1,100	61.3 ~ 63.3	410 ~ 430		
	1,100	47.0 ~ 52.0	0		
	850	57.9 ~ 59.9	240 ~ 260		
	2,000	50.8 ~ 55.8	410 ~ 430		
	2,150	47.5 ~ 53.5	410 ~ 430		
	2,250	40.3 ~ 45.3	410 ~ 430		
	2,500	11.9 ~ 20.9	410 ~ 430		
	2,700	Below 3.0	410 ~ 430		
Switch OFF Magnet valve	375	0	0		
Idling	375 450	6.4 ~ 10.4 Below 5.0			
3-5 Solenoid	Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V				

4. Dimensions		
K	3.2 ~ 3.7	mm
KF	5.7 ~ 5.9	mm
MS	0.8 ~ 1.0	mm
BCS	3.4 ~ 3.6	mm
Pre-stroke	—	mm
Control lever angle		
α	6.0 ~ 14.0	deg
A	4.0 ~ 9.2	mm
β	31.0 ~ 41.0	deg
B	8.8 ~ 12.8	mm
γ	—	deg
C	—	mm

O Note

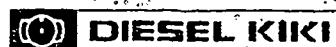
- If there is no designation in the specifications for the Solenoid Timer's ON-OFF position, then the position should be regarded as OFF.
- When confirming timing device travel and supply pump pressure characteristics, apply boost pressure of 410 ~ 430 mmHg to the boost chamber.

■ POTENTIOMETER ADJUSTMENT

Under the following conditions, alter the potentiometer's installation position so that the output voltage equals the specified value.

Adjustment Conditions			Specified Value	Remarks
Control lever position	Pump speed (rpm)	Fuel injection quantity (cc/1000st)	Out-put voltage (V)	
Measure	750	17.8 ± 1.0	4.0 ± 0.03	Adjusting point
Idle	—	—	—	Check point
Full speed	—	—	—	Check point

[In-put Voltage: 10V]



DIESEL KIKI CO., LTD.

Service Department

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INJ. PUMP CALIBRATION DATA

TEST OIL:
ISO 4113 or
SAE J967d

ENGINE MODEL : TD25

BOSCH No. 9 460 610 351 1/3
OKKC No. 104740-7230
Date : 10, April 1989 0
Company : NISSAN DIESEL
No. 16700 30N07

Injection pump No.: 104640-7230 [NP-VE4/10F2150RNP799]
Pump rotation : Clockwise-viewed from drive side

For Test Condition see
Microfiche No. WP-210 (N-16)

1. Test Conditions

1-1 Nozzle : 105780-0000 (NP-DN12SD12T)
1-2 Nozzle holder : 105780-2080 (EF8511/9)
1-3 Nozzle opening pressure : 150⁻⁵ kg/cm²
1-4 Injection pipe : 2 x 6 x 840 mm
1-5 Fuel oil temperature : 45^{±5} °C
1-6 Supply pump pressure : 0.2 kg/cm²

2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1	Timing device travel	1,100	S/T: ON: 3.9 ~ 4.7 OFF: T-2.4 ~ 2.8 (mm)		
2-2	Supply pump pressure	1,100	S/T: ON: 4.8 ~ 5.6 OFF: 3.8 ~ 4.4 (kg/cm ²)		
2-3	Full load delivery	1,100	48.0 ~ 49.0 (cc/1,000st)		3.0
2-4	Full load delivery		(cc/1,000st)		
2-5	Idle speed regulation	350	4.5 ~ 8.5 (cc/1,000st)		2.0
2-6	Start	100	45.0 ~ 80.0 (cc/1,000st)		
2-7	Full-load speed regulation	1,100	10.1 ~ 14.1 (cc/1,000st)		
2-8	Load-timer Adjustment	1,100	T-0.7 ± 0.2 (mm)		
2-9					

3. Test Specifications		Solenoid Timer	ON	OFF	
3-1	Timing device	N = rpm mm	1,100 3.8 ~ 4.8	1,700 5.7 ~ 7.3	2,300 2.3 ~ 2.9 4.3 ~ 5.5 6.0 ~ 7.0
3-2	Supply pump	N = rpm kg/cm ²	1,100 4.8 ~ 5.6	1,700 6.2 ~ 7.0	2,150 3.8 ~ 4.4 5.2 ~ 5.8 6.1 ~ 6.7
3-3	Overflow delivery	N = rpm cc/10s	1,100 43.0 ~ 87.0	1,100 (without O-ring) 60 ~ 103	

Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
Max. speed	1,100 600 2,150 2,300 2,500 2,700	47.5 ~ 49.5 45.1 ~ 49.1 38.5 ~ 42.7 28.3 ~ 37.3 9.6 ~ 14.6 Below 5.0		
Switch OFF Magnet valve	350	0		
Idling	350 450	4.5 ~ 8.5 Below 3.0		
3-5 Solenoid	Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V			

4. Dimensions

K ^o	3.2 ~ 3.4 mm
KF	5.7 ~ 5.9 mm
MS	0.9 ~ 1.1 mm
BCS	— mm
Pre-stroke	— mm
Control lever angle	
α	35.4 ~ 43.4 deg
γ_a	24.3 ~ 28.7 mm
β	31.0 ~ 41.0 deg
γ_B	9.3 ~ 12.9 mm
γ_C	— deg — mm

O Note

■ If there is no designation in the specifications for the Solenoid Timer's ON-OFF position, then the position should be regarded as OFF.

■ LOAD TIMER ADJUSTMENT

1) Adjustment

① Fix the control lever in the position satisfying the following conditions.

Boost Pressure : — mmHg

Pump Speed : 1,100 rpm

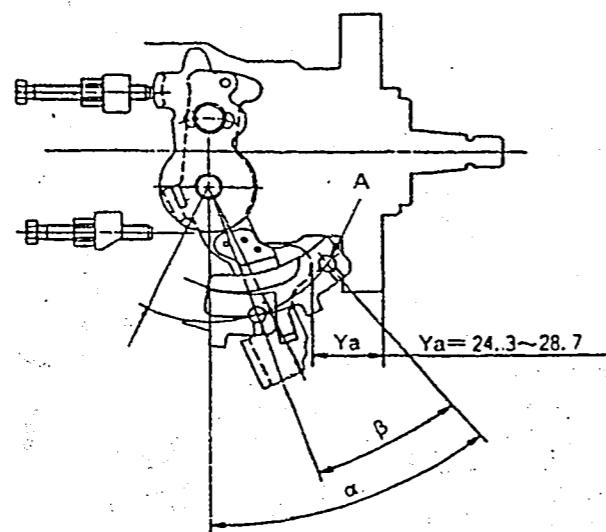
Fuel Injection : 39.0 ± 0.5 cc/1000st
Quantity

② With the control lever positioned as described in ① above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values (item 2 ~ 7).

Control lever position		Specified Values		
Pump Speed (rpm)	Fuel Injection Quantity (cc/1000st)	Boost pressure (mmHg)	Timer stroke (mm)	Timer stroke reduction value (mm)
1,100	39.0 ± 1.0	—	—	0.7 ± 0.2
1,100	30.0 ± 2.5	—	—	1.4 ± 0.5

Control Lever Angle Measurement Position

① Measure the control lever angles (α , β , γ) at hole A.



INJ. PUMP CALIBRATION DATA

ENGINE MODEL : TD25

TEST OIL:
ISO 4113 or
SAE J967dInjection pump No.: 104640-7240 [NP-VE4/10F2150RNPB00]
Pump rotation : Clockwise-viewed from drive side

BOSCH No. 9 460 610 352 1/2
 DKKC No. 104740-7240
 Date : 10, April 1989
 Company : NISSAN DIESEL
 No. 16700 30N08

For Test Condition see
Microfiche No. WP-210 (N-16)

1. Test Conditions

1-1 Nozzle : 105780-0000 (NP-DN12SD12T)
 1-2 Nozzle holder : 105780-2080 (EF8511/9)
 1-3 Nozzle opening pressure : 150^{+5} kg/cm^2
 1-4 Injection pipe : $2 \times 6 \times 840 \text{ mm}$
 1-5 Fuel oil temperature : $45^{+5} \text{ }^{\circ}\text{C}$
 1-6 Supply pump pressure : 0.2 kg/cm^2

2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1	Timing device travel	1,100	S/T ON: 3.9 ~ 4.7 (mm) OFF: 2.4 ~ 2.8	S/T: Solenoid timer	
2-2	Supply pump pressure	1,100	S/T ON: 4.5 ~ 5.3 (kg/cm ²) OFF: 3.5 ~ 4.1		
2-3	Full load delivery	1,100	48.0 ~ 49.0 (cc/1,000st)		3.0
2-4	Idle speed regulation	350	4.5 ~ 8.5 (cc/1,000st)		2.0
2-5	Start	100	45.0 ~ 80.0 (cc/1,000st)		
2-6	Full-load speed regulation	2,500	10.1 ~ 14.1 (cc/1,000st)		
2-7					
2-8					
2-9					

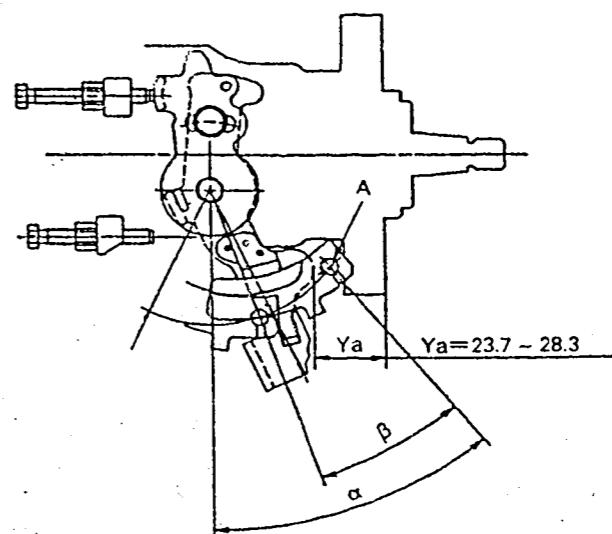
3. Test Specifications		Solenoid Timer	ON	OFF
3-1	Timing device	N = rpm mm	1,100 3.8 ~ 4.8	1,100 2.3 ~ 2.9
3-2	Supply pump	N = rpm kg/cm ²	1,100 4.5 ~ 5.3	1,700 4.3 ~ 5.5
3-3	Overflow delivery	N = rpm cc/10s	1,100 43.0 ~ 87.0	1,100 (without O-ring) 60 ~ 103

3-4 Fuel injection quantities

Speed-control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
Max. speed	1,100	47.5 ~ 49.5		
	600	45.1 ~ 49.1		
	2,150	38.5 ~ 42.7		
	2,300	28.3 ~ 37.3		
	2,500	9.6 ~ 14.6		
	2,700	Below 5.0		
Switch OFF Magnet valve	350	0		
Idling	350 450	4.5 ~ 8.5 Below 3.0		
3-5 Solenoid	Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V			

■ Control Lever Angle Measurement Position

① Measure the control lever angles (α , β , γ) at hole A.



○ Note

■ If there is no designation in the specifications for the Solenoid Timer's ON-OFF position, then the position should be regarded as OFF.

4. Dimensions

K	3.2 ~ 3.4	mm
KF	5.7 ~ 5.9	mm
MS	0.9 ~ 1.1	mm
BCS	—	mm
Pre-stroke	—	mm
Control lever angle		
α	50.0 ~ 58.0	deg
Ya	23.7 ~ 28.3	mm
β	37.0 ~ 47.0	deg
B	10.7 ~ 14.8	mm
γ	—	deg
C	—	mm

INJ. PUMP CALIBRATION DATA

TEST OIL:
IS 0 4113 or
SAE J967d

Injection pump No.: 104640-9722 [NP-VE4/10F2150RNP605]
Pump rotation: Clockwise-viewed from drive side

ENGINE MODEL : TD27

BOSCH No. 9 460 610 343 1/2
DKKC No. 104740-9723
Date : 10, April 1989
Company : NISSAN DIESEL
No. 16700 21N01

For Test Condition see
Microfiche No. WP-210 (N-16)

1. Test Conditions

1-1 Nozzle : 105780-0000 (NP-DN12SD12T)
1-2 Nozzle holder : 105780-2080 (EF8511/9)
1-3 Nozzle opening pressure : 150^{±5} kg/cm²
1-4 Injection pipe : 2 x 6 x 840 mm
1-5 Fuel oil temperature : 45^{±5} °C
1-6 Supply pump pressure : 0.2 kg/cm²

2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1	Timing device travel	1,100	S/T ON: 3.9 ~ 4.7 OFF: 2.4 ~ 2.8 S/T ON: 4.5 ~ 5.3 OFF: 3.5 ~ 4.1	(mm) (kg/cm ²)	S/T: Solenoid timer
2-2	Supply pump pressure	1,100	51.7 ~ 52.7	(cc/1,000st) (cc/1,000st)	3.0
2-3	Full load delivery	1,100	5.3 ~ 9.3	(cc/1,000st)	2.0
2-4	Idle speed regulation	400	45.0 ~ 80.0	(cc/1,000st)	
2-5	Start	100	31.0 ~ 35.0	(cc/1,000st)	
2-6	Full-load speed regulation	2,350			
2-7					
2-8					
2-9					

3. Test Specifications		Solenoid Timer	ON	OFF		
3-1	Timing device	N = rpm mm	1,100 3.8 ~ 4.8	1,100 2.3 ~ 2.9	1,700 4.3 ~ 5.5	2,550 6.8 ~ 7.8
3-2	Supply pump	N = rpm kg/cm ²	1,100 4.5 ~ 5.3	1,700 5.9 ~ 6.7	1,100 3.5 ~ 4.1	2,150 4.9 ~ 5.5
3-3	Overflow delivery	N = rpm cc/10s	1,100 (S/T: ON) 43.0 ~ 87.0	1,100 (S/T: ON without O-ring) 60 ~ 103		

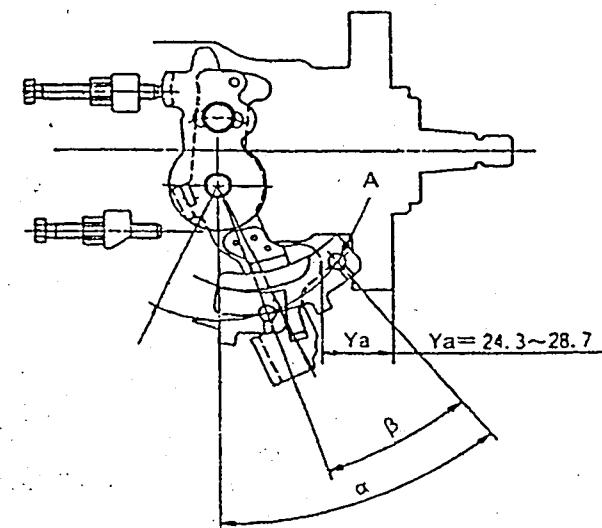
3-4 Fuel injection quantities				
Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
Max. speed	1,100 600 2,150 2,350 2,550 2,700	51.2 ~ 53.2 50.8 ~ 54.8 40.8 ~ 45.0 30.5 ~ 35.5 5.6 ~ 14.6 Below 5.0		
Switch OFF Magnet valve	400	0		
Idling	400 500	5.3 ~ 9.3 Below 3.0		
3-5 Solenoid	Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V			

O Note

- If there is no designation in the specifications for the Solenoid Timer's ON-OFF position, then the position should be regarded as OFF.

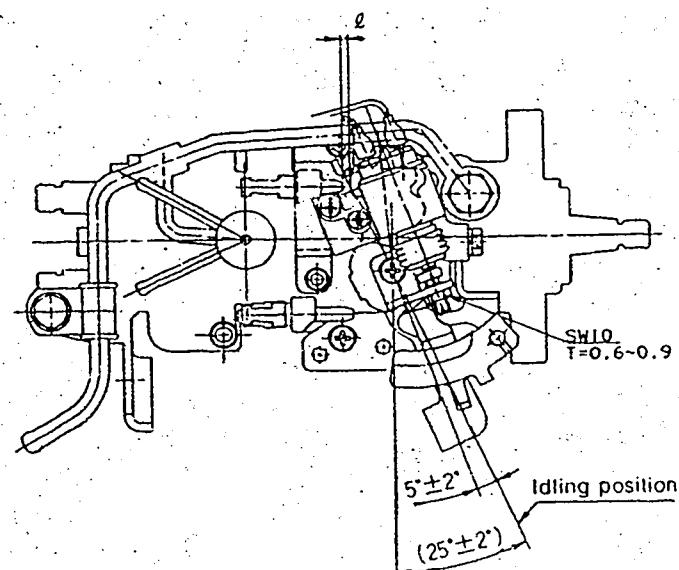
■ Control Lever Angle Measurement Position

- Measure the control lever angles (α , β , γ) at hole A.



■ Accelerator Switch Adjustment

- Insert a block gauge of 3.3 ± 0.13 mm (l) thickness between the idling stopper bolt and the control lever.
- Then, adjust the installation position of the accelerator switch so that it is turned OFF.



INJ. PUMP CALIBRATION DATA

ENGINE MODEL : TD23

TEST OIL:
IS 0 4113 or
SAE J967dInjection pump No.: 104640-9840 [NP-VE4/10F2150RNP656]
Pump rotation : Clockwise-viewed from drive side

BOSCH No. 9 460 610 341 1/2
 DKKC No. 104740-9850
 Date : 10, April 1989
 Company : NISSAN DIESEL
 No. 16700 02N74

For Test Condition see
Microfiche No. WP-210 (N-16)

1. Test Conditions

1-1 Nozzle : 105780-0000 (NP-DN12SD12T)	1-4 Injection pipe : 2 x 6 x 840 mm
1-2 Nozzle holder : 105780-2080 (EF8511/9)	1-5 Fuel oil temperature : 45 ^{±5} °C
1-3 Nozzle opening pressure : 150 ^{±5} kg/cm ²	1-6 Supply pump pressure : 0.2 kg/cm ²

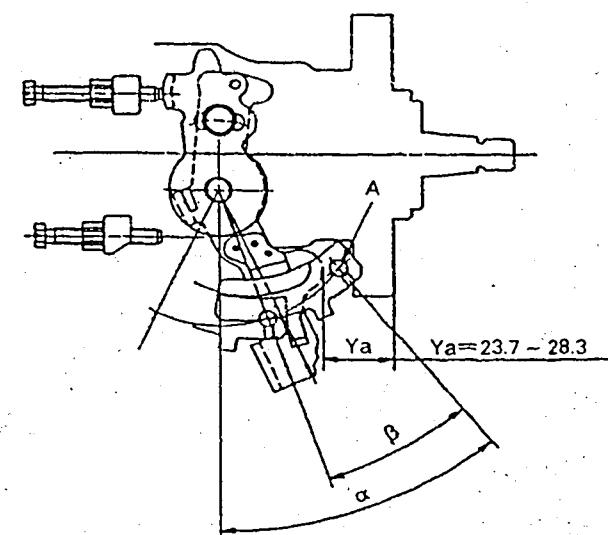
2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1	Timing device travel	1,100	2.3 ~ 2.7 (mm)		
2-2	Supply pump pressure	1,100	3.5 ~ 4.1 (kg/cm ²)		
2-3	Full load delivery	1,100	44.1 ~ 45.1 (cc/1,000st)		3.0
2-4	Idle speed regulation		(cc/1,000st)		
2-5	Start	350	4.5 ~ 8.5 (cc/1,000st)		2.0
2-6	Full-load speed regulation	100	45.0 ~ 80.0 (cc/1,000st)		
2-7		2,350	28.3 ~ 32.3 (cc/1,000st)		
2-8					
2-9					

3. Test Specifications		Solenoid Timer	OFF	ON
3-1 Timing device	N = rpm mm	1,100 2.2 ~ 2.8	1,700 4.1 ~ 5.1	2,550 6.4 ~ 7.4
3-2 Supply pump	N = rpm kg/cm ²	1,100 3.5 ~ 4.1	1,700 4.9 ~ 5.5	2,150 5.8 ~ 6.4
3-3 Overflow delivery	N = rpm cc/10s	1,100 43.0 ~ 87.0	(Solenoid timer: ON)	

Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
Max. speed	1,100 600 2,150 2,350 2,550 2,700	43.6 ~ 45.6 41.5 ~ 45.5 35.9 ~ 40.1 27.8 ~ 32.8 5.3 ~ 12.4 Below 5.0		
Switch OFF Magnet valve	350	0		
Idling	350 450	4.5 ~ 8.5 Below 2.0		
3-5 Solenoid	Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V			

■ Control Lever Angle Measurement Position

① Measure the control lever angles (α , β , γ) at hole A.



○ Note

■ If there is no designation in the specifications for the Solenoid Timer's ON-OFF position, then the position should be regarded as OFF.

4. Dimensions		
K	3.2 ~ 3.4	mm
KF	5.7 ~ 5.9	mm
MS	0.9 ~ 1.1	mm
BCS	—	mm
Pre-stroke	—	mm
Control-lever angle		
α	50.0 ~ 58.0	deg
Ya	23.7 ~ 28.3	mm
β	37.0 ~ 47.0	deg
B	10.7 ~ 14.8	mm
γ	—	deg
C	—	mm

INJ. PUMP CALIBRATION DATA

ENGINE MODEL : TD27

TEST OIL:
ISO 4113 or
SAE J967dInjection pump No.: 104640-9930 [NP-VE4/10F2150NP710]
Pump rotation : Clockwise-viewed from drive side

BOSCH No. 9 460 610 344 1/2
 DKKC No. 104740-9930
 Date : 10, April 1989 0
 Company : NISSAN DIESEL
 No. 16700 31N01

For Test Condition see
Microfiche No. WP-210 (N-16)

1. Test Conditions

1-1 Nozzle : 105780-0000 (NP-DN12SD12T)
 1-2 Nozzle holder : 105780-2080 (EF8511/9)
 1-3 Nozzle opening pressure : 150^{±5} kg/cm²
 1-4 Injection pipe : 2 x 6 x 840 mm
 1-5 Fuel oil temperature : 45^{±5} °C
 1-6 Supply pump pressure : 0.2 kg/cm²

2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1	Timing device travel	1,100	S/T ON: 3.9 ~ 4.7 OFF: 2.4 ~ 2.8 (mm)	S/T: Solenoid timer	
2-2	Supply pump pressure	1,100	S/T ON: 4.5 ~ 5.3 OFF: 3.5 ~ 4.1 (kg/cm ²)		
2-3	Full load delivery	1,100	51.8 ~ 52.8 (cc/1,000st)		3.0
2-4	Idle speed regulation		(cc/1,000st)		
2-5	Start	350	5.3 ~ 9.3 (cc/1,000st)		2.0
2-6	Full-load speed regulation	100	45.0 ~ 80.0 (cc/1,000st)		
2-7		2,350	31.0 ~ 35.0 (cc/1,000st)		
2-8					
2-9					

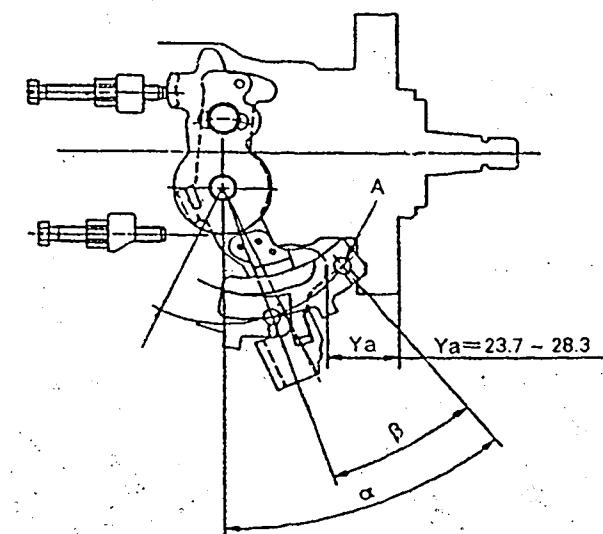
3. Test Specifications		Solenoid Timer	ON	OFF
3-1	Timing device	N = rpm mm	1,100 3.8 ~ 4.8	1,100 2.3 ~ 2.9 1,700 4.3 ~ 5.5 2,550 6.8 ~ 7.8
3-2	Supply pump	N = rpm kg/cm ²	1,100 4.5 ~ 5.3 1,700 5.7 ~ 6.7	1,100 3.5 ~ 4.1 1,700 4.9 ~ 5.5 2,150 5.8 ~ 6.4
3-3	Overflow delivery	N = rpm cc/10s	1,100 43.0 ~ 87.0 1,100 (without O-ring) 60 ~ 103	

3-4 Fuel injection quantities

Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
Max. speed	1,100	51.3 ~ 53.3		
	600	50.9 ~ 54.9		
	2,150	40.9 ~ 45.1		
	2,350	30.5 ~ 35.5		
	2,550	6.6 ~ 13.6		
	2,700	Below 5.0		
Switch OFF Magnet valve	350	0		
Idling	350 450	5.3 ~ 9.3 Below 3.0		
3-5 Solenoid	Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V			

■ Control Lever Angle Measurement Position

① Measure the control lever angles (α , β , γ) at hole A.



○ Note

■ If there is no designation in the specifications for the Solenoid Timer's ON-OFF position, then the position should be regarded as OFF.

■ Accelerator Switch Adjustment

1. Insert a block gauge of 5.2 ± 0.13 mm thickness between the idling stopper bolt and the control lever. (Control lever angle: $8^\circ \pm 2^\circ$)
2. Then, adjust the installation position of the accelerator switch so that it is turned OFF.

INJ. PUMP CALIBRATION DATA

TEST OIL:
ISO 4113 or
SAE J967d

ENGINE MODEL : 4JB1-PK

BOSCH No. 9 460 610 345

DKKC No. 104741-1193

Date : 10. April, 1989

Company : ISUZU

No. 894404 0322

For Test Condition see
Microfiche No. WP-210 (N-16)

1. Test Conditions

1-1	Nozzle : 105780-0000 (NP-DN12SDi2T)	1-4	Injection pipe : 2 x 6 x 840 mm
1-2	Nozzle holder : 105780-2080 (EF8511/9)	1-5	Fuel oil temperature : 45 ^{±5} °C
1-3	Nozzle opening pressure : 150 ^{±5} kg/cm ²	1-6	Supply pump pressure : 0.2 kg/cm ²

2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1	Timing device travel	1,400	0 (mm)		
2-2	Supply pump pressure	800	2.6 ~ 3.0 (kg/cm ²)		
2-3	Full load delivery	800	49.0 ~ 50.0 (cc/1,000st) (cc/1,000st)		3.5
2-4	Idle speed regulation	375	7.6 ~ 11.6 (cc/1,000st)		2.0
2-5	Start	100	75.0 ~ 115.0 (cc/1,000st)		
2-6	Full-load speed regulation	1,400	18.9 ~ 24.9 (cc/1,000st)		4.5
2-7					
2-8					
2-9					

3. Test Specifications

3-1 Timing device	N = rpm mm	1,400 0		
3-2 Supply pump	N = rpm kg/cm ²	600 1.8 ~ 2.4	800 2.6 ~ 3.0	1,300 4.4 ~ 5.0
3-3 Overflow delivery	N = rpm cc/10s	800 30.0 ~ 73.3		

3-4 Fuel injection quantities

Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
Max. speed	800	48.5 ~ 50.5		
	500	54.3 ~ 62.4		
	700	46.6 ~ 51.6		
	1,000	46.6 ~ 51.6		
	1,300	48.1 ~ 54.1		
	1,350	43.2 ~ 52.2		
	1,400	18.4 ~ 25.5		
	1,450	Below 5.0		
Switch OFF Magnet valve	500	0		
Idling	500 600	7.6 ~ 11.6 Below 3.0		
3-5 Solenoid	Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V			

4. Dimensions

K	2.7 ~ 2.9 mm
KF	4.9 ~ 5.1 mm
MS	0.9 ~ 1.1 mm
BCS	— mm
Pre-stroke	0.43 ~ 0.47 mm
Control lever angle	
α	14.0° ~ 22.0° deg
A	2.5 ~ 7.6 mm
β	31.5° ~ 41.5° deg
B	9.2 ~ 13.0 mm
γ	— deg
C	— mm

INJ. PUMP CALIBRATION DATA

ENGINE MODEL : R2

TEST OIL:
IS 0 4113 or
SAE J967dInjection pump No.: 104648-0212 [NP-VE4/8F2125RNP286]
Pump rotation : Clockwise-viewed from drive side

BOSCH No. 9 460 610 342 1/4

DKKC No. 104748-0212

Date : 10. April 1989

Company : MAZDA

No. R23413800B

For Test Condition see
Microfiche No. WP-210 (N-16)

1. Test Conditions

1-1 Nozzle : 105780-0000 (NP-DN12SD12T)	1-4 Injection pipe : 2 x 6 x 840 mm
1-2 Nozzle holder : 105780-2080 (EF8511/9)	1-5 Fuel oil temperature : 45 ^{±5} °C
1-3 Nozzle opening pressure : 150 ^{±5} kg/cm ²	1-6 Supply pump pressure : 0.2 kg/cm ²

2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1 Timing device travel		1,250	3.3 ~ 3.7 (mm)		
2-2 Supply pump pressure		1,250	4.9 ~ 5.5 (kg/cm ²)		
2-3 Full load delivery		1,500	38.2 ~ 39.2 (cc/1,000st)		2.5
2-4 Full load delivery			(cc/1,000st)		
2-5 Idle speed regulation		350	6.0 ~ 10.0 (cc/1,000st)		2.0
2-6 Start		100	Above 42 (cc/1,000st)		
2-7 Full-load speed regulation		2,400	11.1 ~ 15.1 (cc/1,000st)		
2-8 Load-timer adjustment		1,250	2.7 ± 0.2 (mm)		4.0
2-9 ACS adjustment		1,500	33.1 ~ 35.1 (cc/1,000st)	-140	

3. Test Specifications					
3-1 Timing device	N = rpm mm	1,250 3.2 ~ 3.8	1500 4.1 ~ 5.3	2,125 7.0 ~ 8.2	
3-2 Supply pump	N = rpm kg/cm ²	500 2.7 ~ 3.3	1,250 4.9 ~ 5.5	2,125 7.3 ~ 7.9	
3-3 Overload delivery	N = rpm cc/10s	1,250 49.7 ~ 93.7			

3-4 Fuel injection quantities				
Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press (mmHg)	Difference in delivery (cc)
Max. speed	1,500 500 1,250 2,125 2,400 2,500 1,250	37.7 ~ 39.7 30.7 ~ 34.7 36.0 ~ 40.0 32.0 ~ 36.0 10.1 ~ 16.1 Below 4.0 32.6 ~ 35.6		
			-140	
Switch OFF Magnet valve	350	0		
Idling	350 450	6.0 ~ 10.0 Below 4.0		
3-5 Solenoid	Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V			

4. Dimensions		
K	3.2 ~ 3.4	mm
KF	5.7 ~ 5.9	mm
MS	1.4 ~ 1.6	mm
BCS	—	mm
Pre-stroke	—	mm
Control lever angle		
α	26.0 ~ 34.0	deg
A	4.0 ~ 9.4	mm
β	40.0 ~ 50.0	deg
B	12.5 ~ 15.8	mm
γ	—	deg
C	—	mm

■ LOAD TIMER ADJUSTMENT

1) Adjustment

① Fix the control lever in the position satisfying the following conditions.

Boost Pressure : — mmHg

Pump Speed : 1250 rpm

Fuel Injection : 28.2 ± 1 cc/1000st

Quantity

② With the control lever positioned as described in ① above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values (2 ~ 7).

2) Confirmation of Timer Characteristics

Fix the control lever in the position satisfying the following conditions, and confirm the Timer Stroke.

Control lever position			Specified Values	
Pump Speed (rpm)	Fuel Injection Quantity (cc/1000st)	Boost pressure (mmHg)	Timer stroke (mm)	Timer stroke reduction value (mm)
1250	28 ± 1.5	—	2.7 ± 0.3	—
1250	18 ± 1.5	—	1.5 ± 0.7	—



DIESEL KIKI CO., LTD.

Service Department

3-6-7 SHIBUYA, SHIBUYA-KU, TOKYO 150, JAPAN
Tel. (03)5485-4135 Fax: (03)797-6069

■ M-CSD Assembly and Adjustment

1) Fixing the M-CSD stopper

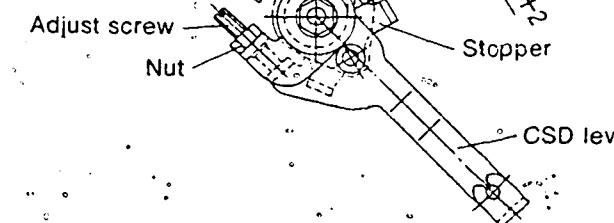
1. Fix the M-CSD assembly temporarily to the pump housing.
2. Turn the drive shaft at least two turns in the direction of pump rotation.
3. Turn the drive shaft slowly, and fix the drive shaft in a position where a load is applied (the point where the roller in the roller holder contacts the cam surface of the cam disc).
4. Move the CSD lever to the advance side.
5. Fix the CSD lever in the position where the ball pin at the tip of the shaft lightly contacts the roller holder (roller holder advance angle "0").
6. Adjust using the adjusting screw so that the gap between the CSD lever and the stopper is $0.5+2$ mm.
7. After adjustment, tighten the M-CSD screw to the specified torque.

$$T=0.6-0.9 \text{ kg} \cdot \text{m}$$

2) FICD screw adjustment

1. Move the CSD lever so that it contacts the stopper.
2. Insert a block gauge (thickness gauge) of 4.8 ± 0.1 mm thickness between the control lever and idling stopper bolt. (Position 7° from idle)
3. Adjust using the FICD screw so that the control lever and FICD screw are in contact.

Adjust screw
Nut
Stopper
CSD lever



Control-lever
Idling stopper bolt
Block gauge



FICD screw
Nut

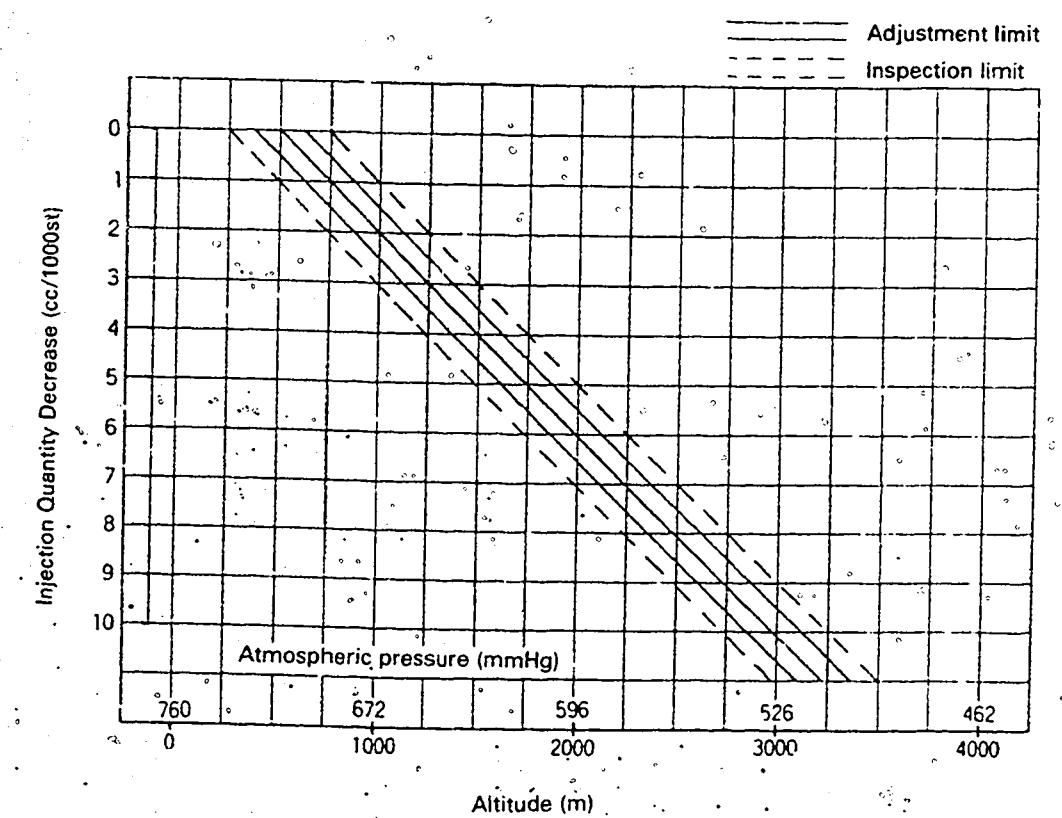
■ FULL-LOAD FUEL INJECTION QUANTITY AND ACS ADJUSTING PROCEDURE AT HIGH ALTITUDES

1) FULL-LOAD FUEL INJECTION QUANTITY ADJUSTMENT

- ① Remove the ACS cover, the bellows and the adjusting shims.
- ② Perform all adjustments as described in the adjusting specifications, except for ACS adjustment.

2) ACS ADJUSTMENT

- ① Attach the ACS cover, the bellows and the adjusting shims.
- ② At a pump speed of 1500 rpm and referring to the graph below, use the shims to adjust the fuel injection quantity decrease quantity according to the altitude.



INJ. PUMP CALIBRATION DATA

1/4

104748-2411 2/4

TEST OIL:
ISO 4113 or
SAE J967d

ENGINE MODEL : CD17

Injection pump No.: 104648-2411 [NP-VE4/8F2500LNP374]
Pump rotation : Counter clockwise-viewed from drive side

BOSCH No. 9 460 610 333
DKC No. 104748-2411
Date : 10, April 1989 [2]
Company : NISSAN
No. 16700 54A00

For Test Condition see
Microfiche No. WP-210 (N-16)

1. Test Conditions

1-1 Nozzle : 105780-0000 (NP-DN12SD12T)
1-2 Nozzle holder : 105780-2080 (EF8511/9)
1-3 Nozzle opening pressure : 150^{+5} kg/cm²

1-4 Injection pipe : 2 x 6 x 840 mm
1-5 Fuel oil temperature : 45^{+5} °C
1-6 Supply pump pressure : 0.2 kg/cm²

2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1	Timing device travel	1,200	1.5 ~ 2.1 (mm)		
2-2	Supply pump pressure	1,200	3.1 ~ 3.7 (kg/cm ²)		
2-3	Full load delivery	1,000	27.1 ~ 29.1 (cc/1,000st) (cc/1,000st)		
2-4	Full load delivery				
2-5	Idle speed regulation	360	3.7 ~ 6.7 (cc/1,000st)		
2-6	Start	100	50.3 ~ 60.3 (cc/1,000st)		
2-7	Full-load speed regulation	2,700	11.8 ~ 17.8 (cc/1,000st)		
2-8					
2-9					

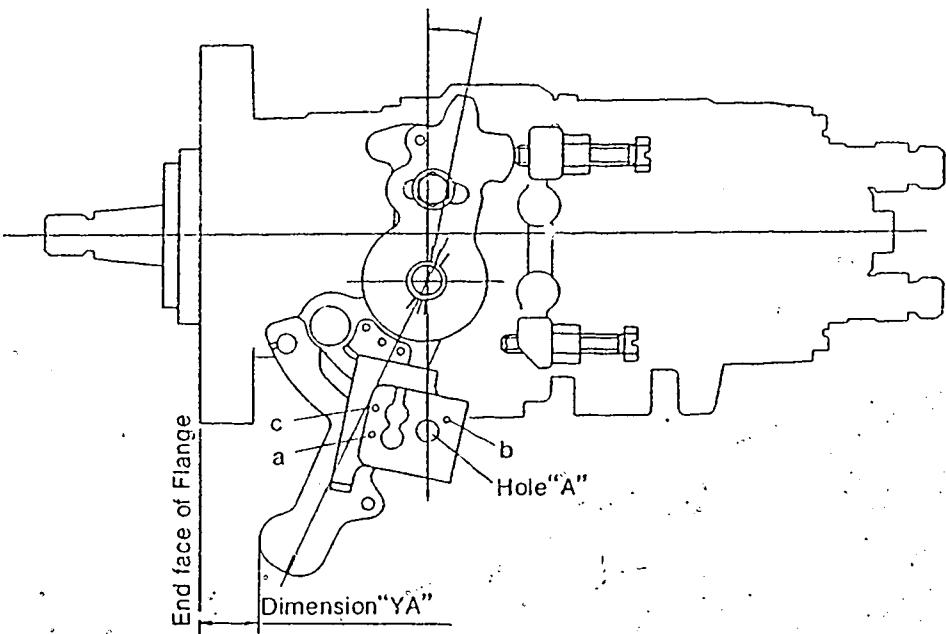
3. Test Specifications					
3-1 Timing device	N = rpm mm	1,200 1.4 ~ 2.2	1,800 3.5 ~ 4.7	2,500 6.9 ~ 7.8	
3-2 Supply pump	N = rpm kg/cm ²	1,200 3.0 ~ 3.8	1,800 4.4 ~ 5.2	2,500 6.1 ~ 6.9	
3-3 Overflow delivery	N = rpm cc/10s	1,200 36.0 ~ 80.0			

3-4 Fuel injection quantities				
Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
Max. speed	2,900	Below 6.0		
	2,700	11.3 ~ 18.3		
	2,500	24.3 ~ 28.3		
	1,000	26.6 ~ 28.6		
	600	24.8 ~ 28.8		
Switch OFF Magnet valve	360	0		
Idling	360 600	3.2 ~ 7.2 Below 3.0		2.5
Partial load	700	10.8 ~ 19.8		
3-5 Solenoid	Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V			

4. Dimensions		
K	3.2 ~ 3.4	mm
KF	5.7 ~ 5.9	mm
MS	1.5 ~ 1.7	mm
BCS	—	mm
Pre-stroke	—	mm
Control lever angle		
α	1.0° ~ -1.0°	deg
A	15.4 ~ 18.1	mm
β	39.0° ~ 49.0°	deg
B	11.0 ~ 16.0	mm
γ	13.5° ~ 14.5°	deg
C	8.6 ~ 9.2	mm

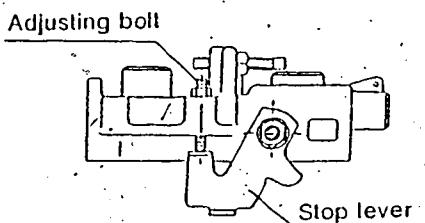
○Control Lever Angle Measurement Position

① Measure the control lever angle (α, β, γ) at hole A.



○Starting Injection Quantity Adjustment

Adjust the starting injection quantity (item 2-5) using the adjusting bolt
(as shown in the figure at below).



OW-CSD Adjustment

1) Timer stroke adjustment

1. Calculate the timer stroke from Fig. 2 according to the atmospheric temperature at the time of adjustment.
2. Adjust using timer stroke adjusting screw so that the timer stroke is as calculated in Step 1.

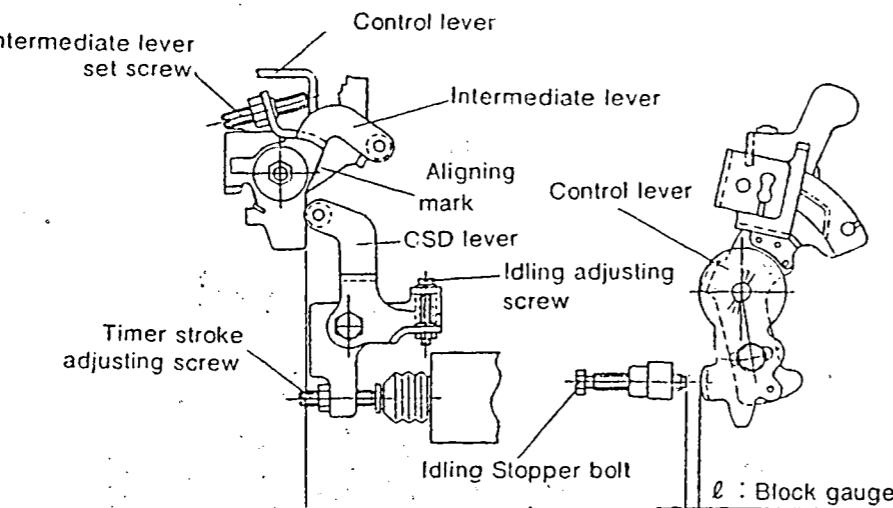


Fig. 1

Formula for calculating Fig. 2

$$10 \leq t \leq 20 \quad T = -0.027t + 1.09$$

Formula for calculating timer stroke:

$$20 \leq t \leq 40 \quad T = -0.0275t + 1.1$$

Formula for calculating control lever and idling stopper bolt gap:

$$t \leq 10 \quad l = 4.6$$

$$10 < t \leq 20 \quad l = -0.17t + 6.3$$

$$20 < t \leq 28.5 \quad l = -0.235t + 7.6$$

$$28.5 < t \leq 36 \quad l = -0.129 + 4.32$$

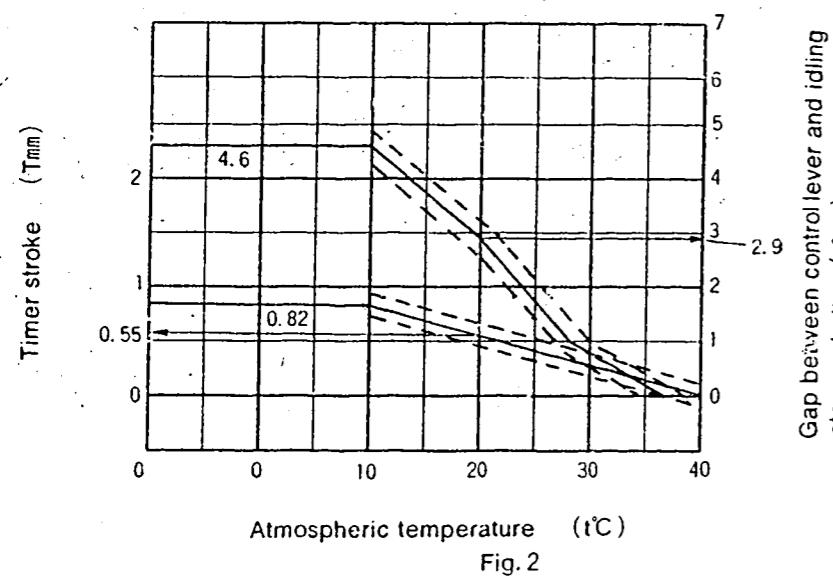


Fig. 2

2) Intermediate lever position adjustment

1. Insert a block gauge (thickness gauge) of $4.1 \pm 0.05\text{mm}$ thickness between the control lever and the idling stopper bolt.
2. Align the intermediate lever with the aligning mark.
3. Adjust the intermediate lever set screw so that the control lever and intermediate lever set screw are in contact, and then fix in position using the locknut.

3) CSD lever adjustment

1. Calculate the block gauge dimension $l \pm 0.05\text{mm}$ from Fig. 2 according to the atmospheric temperature at the time of adjustment.
2. Insert the block gauge (thickness gauge) selected in Step(1) above between the bracket and the idling stopper bolt.
3. Using the idling bolt, adjust so that the CSD lever roller and intermediate lever are in contact.

Note:

1. The temperature of the wax must be below 30°C when adjusting.
2. When inserting a block gauge (thickness gauge) between the control lever (beacket) and the idling stopper bolt, use the idling adjusting bolt to separate the CSD lever and intermediate lever so that no excessive force is exerted on them.

INJ. PUMP CALIBRATION DATA

1/4

104748-2421 2/4

TEST OIL:
ISO 4113 or
SAE J967d

ENGINE MODEL : CD17

Injection pump No.: 104548-2411 [NP-VE4/8F2500LNP374]
Pump rotation: Counter clockwise viewed from drive side

BOSCH No. 9 460 610 334
DKKC No. 104748-2421
Date : 10, April 1989 [2]
Company : NISSAN
No. 16700 54A10

For Test Condition see
Microfiche No. WP-210 (N-16)

1. Test Conditions

1-1 Nozzle : 105780-0000 (NP-DN12SD12T)	1-4 Injection pipe : 2 x 6 x 840 mm
1-2 Nozzle holder : 105780-2080 (EF8511/9)	1-5 Fuel oil temperature : 45 ^{±5} °C
1-3 Nozzle opening pressure : 150 ^{±5} kg/cm ²	1-6 Supply pump pressure : 0.2 kg/cm ²

2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1	Timing device travel	1,200	1.5 ~ 2.1 (mm)		
2-2	Supply pump pressure	1,200	3.1 ~ 3.7 (kg/cm ²)		
2-3	Full load delivery	1,000	27.1 ~ 29.1 (cc/1,000st)		
2-4	Full load delivery		(cc/1,000st)		
2-5	Idle speed regulation	360	3.7 ~ 6.7 (cc/1,000st)		
2-6	Start	100	50.3 ~ 60.3 (cc/1,000st)		
2-7	Full-load speed regulation	2,700	11.8 ~ 17.8 (cc/1,000st)		
2-8					
2-9					

3. Test Specifications

3-1 Timing device	N = rpm mm	1,200 1.4 ~ 2.2	1,800 3.5 ~ 4.7	2,500 6.9 ~ 7.8
3-2 Supply pump	N = rpm kg/cm ²	1,200 3.0 ~ 3.8	1,800 4.4 ~ 5.2	2,500 6.1 ~ 6.0
3-3 Overflow delivery	N = rpm cc/10s	1,200 36.0 ~ 80.0		

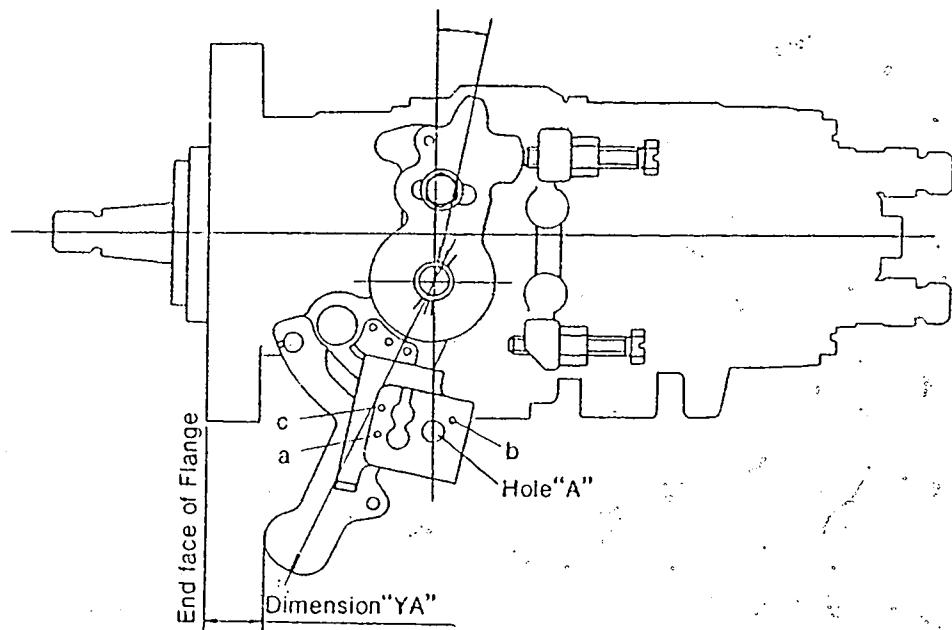
3-4 Fuel injection quantities

Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
Max. speed	2,900	Below 6.0		
	2,700	11.3 ~ 18.3		
	2,500	24.3 ~ 28.3		
	1,000	26.6 ~ 28.6		
	600	24.8 ~ 28.8		
Switch OFF Magnet valve	360	0		
Idling	360 600	3.2 ~ 7.2 Below 3.0		2.5
Partial load	700	10.8 ~ 19.8		
3-5 Solenoid	Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V			

4. Dimensions		
K	3.2 ~ 3.4	mm
KF	5.7 ~ 5.9	mm
MS	1.5 ~ 1.7	mm
BCS	—	mm
Pre-stroke	—	mm
Control lever angle		
α	1.0° ~ -1.0°	deg
A	15.4 ~ 18.1	mm
β	39.0° ~ 49.0°	deg
B	11.0 ~ 16.0	mm
γ	13.5° ~ 14.5°	deg
C	8.6 ~ 9.2	mm

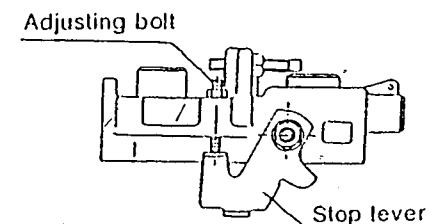
○Control Lever Angle Measurement Position

① Measure the control lever angle (α, β, γ) at hole A.



○Starting Injection Quantity Adjustment

Adjust the starting injection quantity (item 2-5) using the adjusting bolt
(as shown in the figure at below)



OW-CSD Adjustment

1) Timer stroke adjustment

1. Calculate the timer stroke from Fig. 2 according to the atmospheric temperature at the time of adjustment.
2. Adjust using timer stroke adjusting screw so that the timer stroke is as calculated in Step 1.

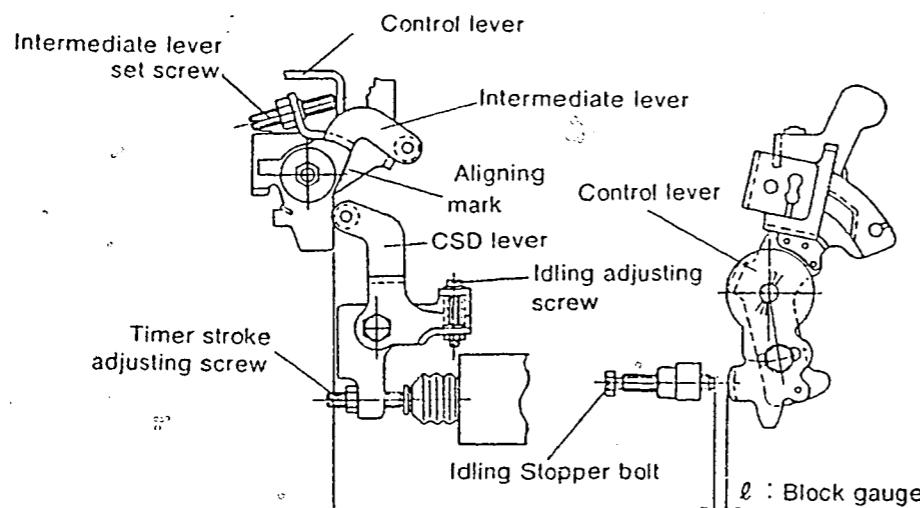


Fig. 1

Formula for calculating Fig. 2 $10 \leq t \leq 20 \quad T = -0.027t + 1.09$

Formula for calculating timer stroke: $20 \leq t \leq 40 \quad T = -0.0275t + 1.1$

Formula for calculating control lever and idling stopper bolt gap:
 $t \leq 10 \quad l = 4.6$
 $10 < t \leq 20 \quad l = -0.17t + 6.3$
 $20 < t \leq 28.5 \quad l = -0.235t + 7.6$
 $28.5 < t \leq 36 \quad l = -0.12t + 4.32$

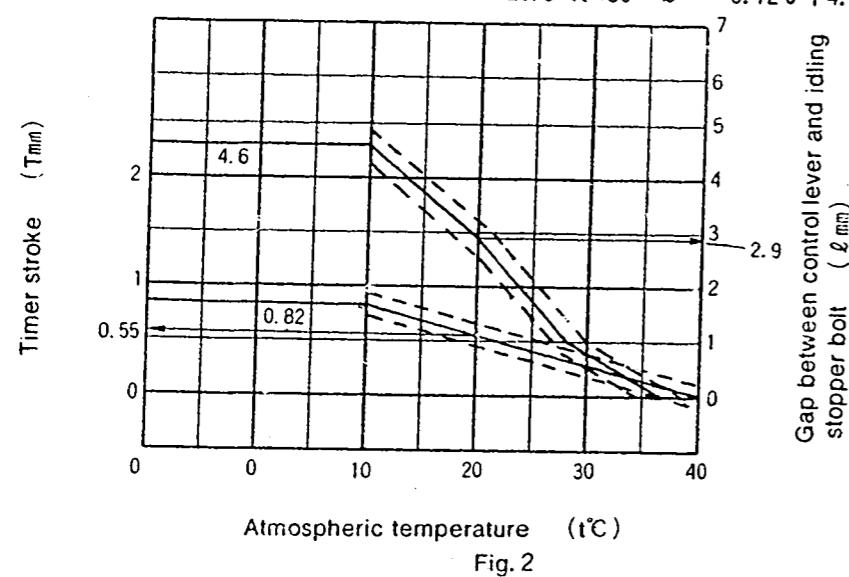


Fig. 2

2) Intermediate lever position adjustment

1. Insert a block gauge (thickness gauge) of $4.1 \pm 0.05\text{mm}$ thickness between the control lever and the idling stopper bolt.
2. Align the intermediate lever with the aligning mark.
3. Adjust the intermediate lever set screw so that the control lever and intermediate lever set screw are in contact, and then fix in position using the locknut.

3) CSD lever adjustment

1. Calculate the block gauge dimension $l \pm 0.05\text{mm}$ from Fig. 2 according to the atmospheric temperature at the time of adjustment.
2. Insert the block gauge (thickness gauge) selected in Step(1) above between the bracket and the idling stopper bolt.
3. Using the idling bolt, adjust so that the CSD lever roller and intermediate lever are in contact.

Note:

1. The temperature of the wax must be below 30°C when adjusting.
2. When inserting a block gauge (thickness gauge) between the control lever (beacket) and the idling stopper bolt, use the idling adjusting bolt to separate the CSD lever and intermediate lever so that no excessive force is exerted on them.

INJ. PUMP CALIBRATION DATA

ENGINE MODEL : PN

TEST OIL:
ISO 4113 or
SAE J967dInjection pump No.: 104649-0343 [NP-VE4/9F2350RNP540]
Pump rotation : Clockwise-viewed from drive side

BOSCH No. 9 460 610 355
 DKKC No. 104749-0460
 Date : 10, April 1989 0
 Company : MAZDA
 No. PN2613800

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For Test Condition see
Microfiche No. WP-210 (N-16)

1. Test Conditions

1-1 Nozzle : 105780-0000 (NP-DN12SD12T)
 1-2 Nozzle holder : 105780-2080 (EF8511/9)
 1-3 Nozzle opening pressure : 150^{±5} kg/cm²

1-4 Injection pipe : 2 x 6 x 840 mm
 1-5 Fuel oil temperature : 45^{±5} °C
 1-6 Supply pump pressure : 0.2 kg/cm²

2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1	Timing device travel	1,500	3.7 ~ 4.1 (mm)		2.5
2-2	Supply pump pressure	1,500	4.4 ~ 5.0 (kg/cm ²)		2.0
2-3	Full load delivery	1,500	32.5 ~ 33.5 (cc/1,000st)		
2-4	Full load delivery		(cc/1,000st)		
2-5	Idle speed regulation	410	5.0 ~ 7.0 (cc/1,000st)		
2-6	Start	100	55.0 ~ 75.0 (cc/1,000st)		
2-7	Full-load speed regulation	2,635	6.0 ~ 10.0 (cc/1,000st)		
2-8	Load-timer Adjustment	1,500	3.0 ~ 3.4 (mm)		4.0
2-9					

3. Test Specifications

3-1 Timing device	N = rpm mm	1,000 1.2 ~ 2.0	1,500 3.6 ~ 4.2	2,000 5.6 ~ 6.8	2,350 7.2 ~ 8.2
3-2 Supply pump	N = rpm kg/cm ²		1,500 4.4 ~ 5.0		2,350 6.8 ~ 7.4
3-3 Overflow delivery	N = rpm cc/10s		1,500 53.0 ~ 97.0		

3-4 Fuel injection quantities

Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
Max. speed	1,500	32.0 ~ 34.0		
	500	28.0 ~ 36.0		
	2,350	26.0 ~ 30.2		
	2,635	5.5 ~ 10.5		
	2,800	Below 3.0		
Switch OFF Magnet valve	410	0		
Idling	410 500	5.0 ~ 7.0 Below 3.0		
3-5 Solenoid	Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V			

4. Dimensions				
K	3.2 ~ 3.4	mm		
KF	5.7 ~ 5.9	mm		
MS	1.4 ~ 1.6	mm		
BCS	—	mm		
Pre-stroke	—	mm		
Control lever angle				
α	23° ~ 27°	deg		
A	34.5 ~ 37.5	mm		
β	38° ~ 48°	deg		
B	11.9 ~ 15.2	mm		
γ	—	deg		
C	—	mm		

■ LOAD TIMER ADJUSTMENT

1) Adjustment

① Fix the control lever in the position satisfying the following conditions.

Boost Pressure : — mmHg

Pump Speed : 1500 rpm

Fuel Injection Quantity : 28.9 ± 1 cc/1000st

② With the control lever positioned as described in ① above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values (2 ~ 7)

2) Confirmation of Timer Characteristics

Fix the control lever in the position satisfying the following conditions, and confirm the Timer Stroke.

Control lever position		Specified Values		
Pump speed (rpm)	Fuel Injection Quantity(cc/1000st)	Boost pressure (mmHg)	Timer stroke (mm)	Timer stroke reduction value (mm)
1500	28.9 ± 1.5	—	3.2 ± 0.3	—
1500	19.9 ± 1.5	—	2.2 ± 0.5	—

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■ Side Link Lever Adjustment

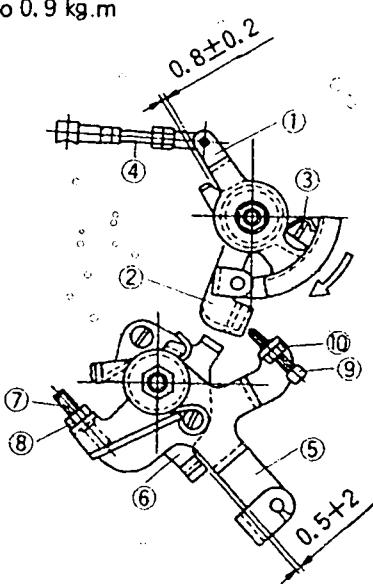
1) Side Link Lever Adjustment

1. Fix the control lever in the idling position.
2. Move the side link lever ② so that it contacts the stopper ③.
3. Rotate the side link lever ① gently in the direction of P so that the connecting rod ④ play is 0 mm.
4. Adjust the length of rod ④ so that the gap between the levers ① and ② is 0.8 ± 0.2 mm.
5. Tighten the two nuts on rod ④.

2) Fixing the M-CSD Stopper

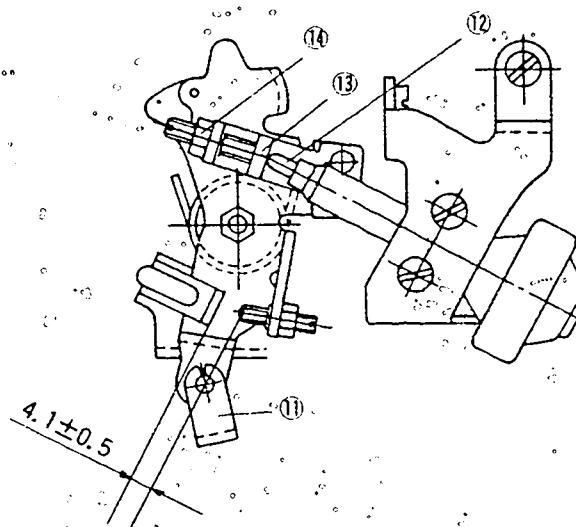
1. Fix the M-CSD assembly to the pump housing.
2. Turn the drive shaft at least two turns in the direction of pump rotation.
3. Turn the drive shaft slowly, and fix the drive shaft in a position where a load is applied (the point where the roller in the roller holder contacts the cam surface of the cam disk).
4. Move the CSD lever to the advance side.
5. Fix the CSD lever in the position where the ball pin at the tip of the shaft lightly contacts the roller holder (roller holder advance angle "0").
6. Adjust using the adjusting screw ⑦ so that the gap between the CSD lever ⑤ and the stopper ⑥ is 0.5 ± 2 mm.
7. After adjustment, tighten the nut ⑧ to the specified torque.

Tightening torque : 0.6 to 0.9 kg.m



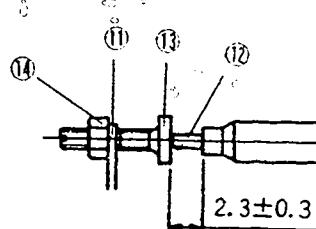
3) M-CSD Adjustment

1. Move the M-CSD lever ⑤ through its full stroke.
2. Adjust the screw ⑨ so that the gap between the control lever ⑪ and the idling adjusting bolt is 4.1 ± 0.5 mm, and then fix the screw ⑨ in this position.



■ DASHPOT ADJUSTMENT.

1. Fix the control lever (11) in the idling position.
2. Adjust the screw (13) so that the pushrod (12) protrudes 2.3 ± 0.3 mm.



INJ. PUMP CALIBRATION DATA

ENGINE MODEL : LD20

TEST OIL:
ISO 4113 or
SAE J967d

Injection pump No.: 104649-2500 [NP-VE4/9F2500RNP728]

Pump rotation : Clockwise-viewed from drive side

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BOSCH No. 9 460 610 338
 DKC No. 104749-2511
 Date : 10, April 1989 [0]
 Company : NISSAN
 No. 16700 D4601

For Test Condition see
Microfiche No. WP-210 (N-16)

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1. Test Conditions

1-1 Nozzle : 105780-0000 (NP-DN12SD12T)
 1-2 Nozzle holder : 105780-2080 (EF8511/9)
 1-3 Nozzle opening pressure : 150^{±5} kg/cm²
 1-4 Injection pipe : 2 x 6 x 840 mm
 1-5 Fuel oil temperature : 45^{±5} °C
 1-6 Supply pump pressure : 0.2 kg/cm²

2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1	Timing device travel	900	1.3 ~ 1.7 (mm)		
2-2	Supply pump pressure	900	3.2 ~ 3.8 (kg/cm ²)		
2-3	Full load delivery	900	32.5 ~ 33.5 (cc/1,000st)		
2-4	Full load delivery		(cc/1,000st)		
2-5	Idle speed regulation	350	4.7 ~ 7.7 (cc/1,000st)		
2-6	Start	100	40.0 ~ 60.0 (cc/1,000st)		
2-7	Full-load speed regulation	2,700	10.9 ~ 16.9 (cc/1,000st)		
2-8					
2-9					

3. Test Specifications		N = rpm mm	900	1,800	2,300
3-1 Timing device			1.2 ~ 1.8	5.5 ~ 6.7	7.7 ~ 8.9
3-2 Supply pump		N = rpm kg/cm ²	900	1,800	2,500
3-3 Overflow delivery		N = rpm cc/10s	3.1 ~ 3.9	5.1 ~ 5.9	6.8 ~ 7.6

3-4 Fuel injection quantities				
Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press (mmHg)	Difference in delivery (cc)
Max. speed	900	32.0 ~ 34.0		
	600	31.2 ~ 35.2		
	2,300	30.6 ~ 34.6		
	2,700	10.4 ~ 17.4		
	2,800	Below 6.0		
Switch OFF Magnet valve	350	0		
Idling	350 500	4.2 ~ 8.2 Below 4.5		2.2
Partial load	900	4.1 ~ 14.1		
3-5 Solenoid	Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V			

4. Dimensions				
K	3.2 ~ 3.4	mm		
KF	5.7 ~ 5.9	mm		
MS	1.1 ~ 1.3	mm		
BCS	—	mm		
Pre-stroke	—	mm		

Control lever angle				
α	21.0° ~ 29.0°	deg		
A	7.6 ~ 11.7	mm		
β	39.0° ~ 49.0°	deg		
B	11.9 ~ 15.6	mm		
γ	10.5° ~ 11.5°	deg		
C	5.5 ~ 6.1	mm		

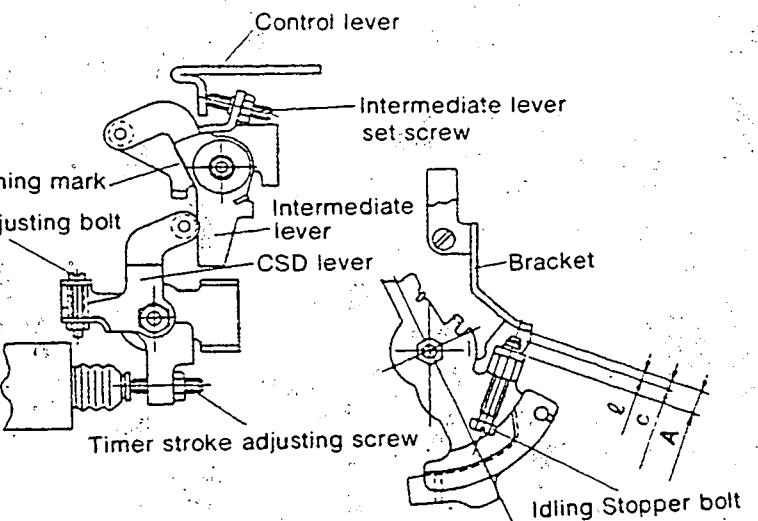
OW-CSD Adjustment

1) Timer stroke adjustment (adjust to the thick line)

1. Calculate the timer stroke from Fig. 2 according to the atmospheric temperature at the time of adjustment:
2. Adjust using timer stroke adjusting screw so that the timer stroke is as calculated in Step 1.

2) Intermediate lever position adjustment

1. Insert a block gauge (thickness gauge) of 0.25 ± 0.05 mm thickness between the bracket and the idling stopper bolt.
2. Align the intermediate lever with the aligning mark.
3. Adjust the intermediate lever set screw so that the control lever and intermediate lever set screw are in contact, and then fix in position using the locknut.



Formula for calculating Fig. 2

$$\text{Formula for calculating timer stroke: } T = -0.0367t + 1.424$$

$$\text{Formula for calculating control lever and idling stopper bolt gap: } \ell = -0.095t + 3.6$$

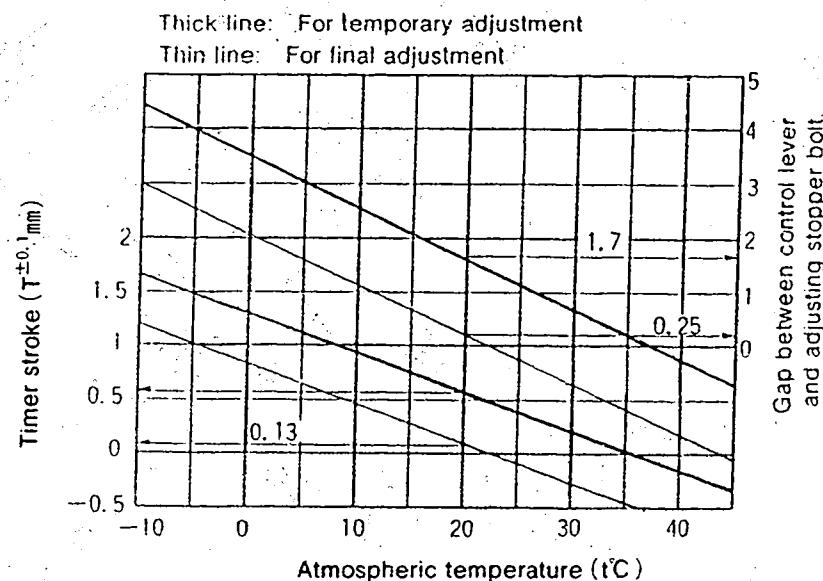


Fig. 2

3)CSD lever adjustment

1. Calculate the block gauge dimension $\ell \pm 0.05\text{mm}$ from Fig. 2 according to the atmospheric temperature at the time of adjustment.
2. Insert the block gauge (thickness gauge) selected in Step(1) above between the bracket and the idling stopper bolt.
3. Using the idling bolt, adjust so that the CSD lever roller and intermediate lever are in contact.

4)Final adjustment

After completing the adjustment, screw the timer stroke adjusting screw two turns clockwise.
(Move from the temporary adjustment chart to the final adjustment chart.)

* This W-CSD's timer stroke operations are effective at atmospheric temperatures of 27°C or above.

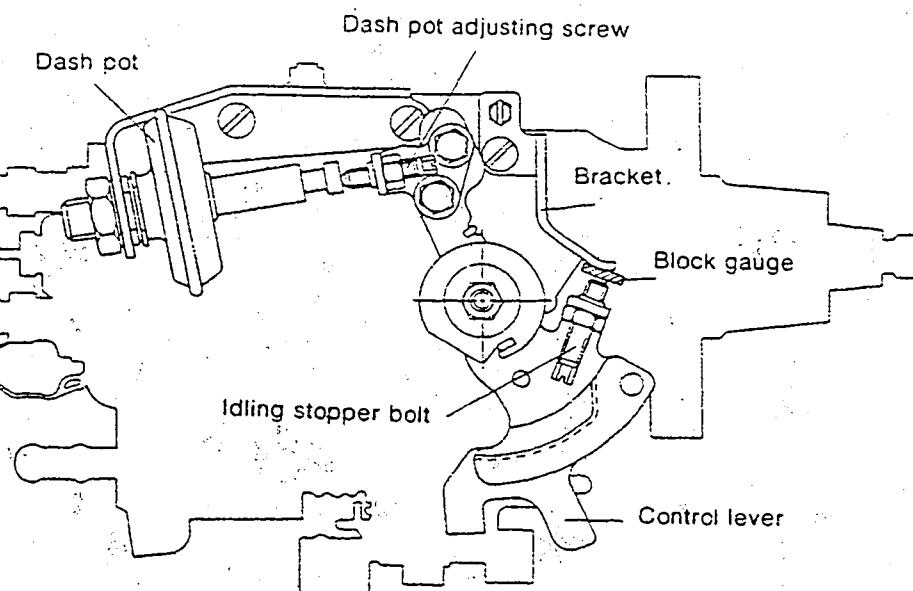
Therefore, to make adjustment at normal temperatures possible, after adjusting to the substitute characteristics, tighten the time stroke adjusting screw two turns.

Note:

1. The temperature of the wax must be below 30°C when adjusting.
2. When inserting a block gauge (thickness gauge) between the control lever (becket) and the idling stopper bolt, use the idling adjusting bolt to separate the CSD lever and intermediate lever so that no excessive force is exerted on them.

○DASH POT ADJUSTMENT

- ① Insert a block gauge (thickness gauge) of thickness 3.8 ± 0.05 in the gap between the control lever and the bracket.
- ② With the control lever positioned as described in ① above, adjust the Dashpot adjusting screw so that the Dashpot adjusting screw and the push rod are in contact. Fix using the nut.



INJ. PUMP CALIBRATION DATA

ENGINE MODEL : 4D65

TEST OIL:
IS 0 4113 or
SAE J967d

Injection pump No.: 104649-3080 [NP-VE4/9F2250RNP421]

Pump rotation : Clockwise-viewed from drive side

BOSCH No. 9 460 610 340
 DKKC No. 104749-3121
 Date : 10, April 1969 [0]
 Company : MITSUBISHI
 No. MD118093

For Test Condition see
Microfiche No. WP-210 (N-16)

1. Test Conditions

1-1 Nozzle : 105780-0000 (NP-DN12SD12T)
 1-2 Nozzle holder : 105780-2080 (EF8511/9)
 1-3 Nozzle opening pressure : 150⁵ kg/cm²
 1-4 Injection pipe : 2 x 6 x 840 mm
 1-5 Fuel oil temperature : 45⁵ °C
 1-6 Supply pump pressure : 0.2 kg/cm²

2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1	Timing device travel	1,750	6.3 ~ 6.7 (mm)		
2-2	Supply pump pressure	1,250	4.5 ~ 5.1 (kg/cm ²)		
2-3	Full load delivery	1,250	33.2 ~ 34.2 (cc/1,000st)		
2-4	Full load delivery		(cc/1,000st)		3.0
2-5	Idle speed regulation	375	5.0 ~ 8.0 (cc/1,000st)		
2-6	Start	100	43.0 ~ 63.0 (cc/1,000st)		
2-7	Full-load speed regulation	2,750	8.1 ~ 14.1 (cc/1,000st)		2.0
2-8					
2-9					2.0

3. Test Specifications

3-1 Timing device	N = rpm mm	750 0.9 ~ 1.9	1,750 6.1 ~ 6.9	2,375 8.8 ~ 10.0	
3-2 Supply pump	N = rpm kg/cm ²	600 2.9 ~ 3.5	1,250 4.5 ~ 5.1	2,250 6.8 ~ 7.4	
3-3 Overflow delivery	N = rpm cc/10s		1,250 48.0 ~ 92.0		

3-4 Fuel injection quantities

Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
Max. speed	1,250 600 750 1,750 2,250 2,375 2,750 3,000	32.7 ~ 34.7 26.7 ~ 30.7 26.9 ~ 30.9 30.7 ~ 34.7 27.8 ~ 31.8 Above 27.0 6.1 ~ 16.1 Below 3.0		
Switch OFF Magnet valve	375	0		
Idling	375 600	4.5 ~ 8.5 Below 3.0		
3-5 Solenoid	Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V			

4. Dimensions

K	3.2 ~ 3.4	mm
KF	5.7 ~ 5.9	mm
MS	1.3 ~ 1.5	mm
BCS	—	mm
Pre-stroke	—	mm
Control lever angle		
α	55.0° ~ 63.0°	deg
A	10.5 ~ 16.0	mm
β	38.0° ~ 46.0°	deg
B	10.5 ~ 15.0	mm
γ	—	deg
C	—	mm

■ W-CSD ADJUSTMENT

1) Timer Stroke Adjustment (Refer to Fig. 1, 2)

- Using the graph (Fig 2), determine the timer stroke according to the atmospheric temperature at the time of adjustment.
- Adjust using the timer stroke adjusting bolt so that the timer stroke corresponds to the value determined in note ① above.

2) Fast Idle Adjustment (Refer to Fig. 1, 2)

- Insert a block gauge of 5.3 ± 0.05 mm thickness in the gap between the control lever and the idling stopper bolt.
- From Fig. 2 determine the dimension of the gap between the idling lever pin and the control lever according to the atmospheric temperature at the time of adjustment.
- Adjust using the fast idle adjusting screw so that the gap corresponds to the value determined in note 2) ② above.

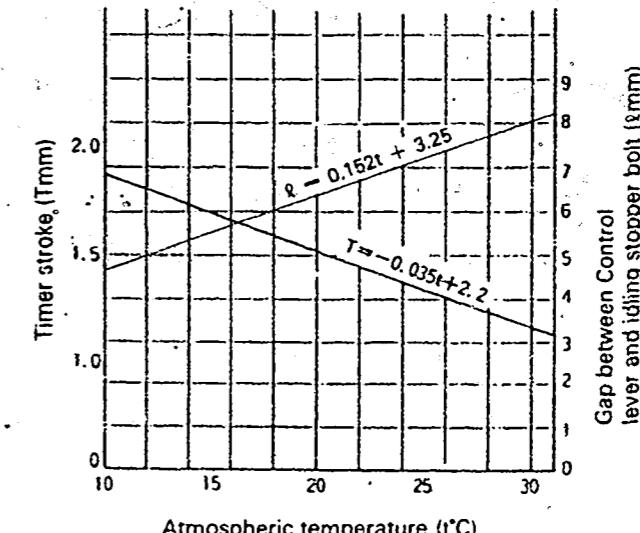
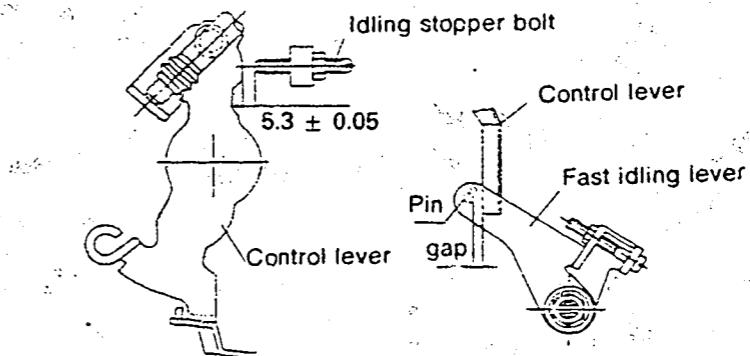
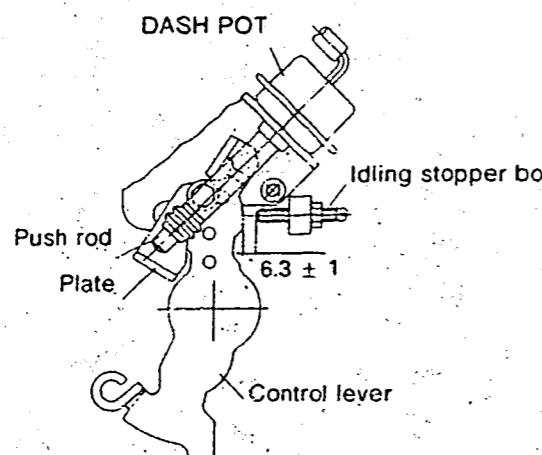


Fig. 2

■ DASH POT ADJUSTMENT

- ① Insert a block gauge (thickness gauge) of thickness 6.3 ± 1 mm in the gap between the control lever and the idling stopper bolt (control lever angle: $8^\circ \sim 12^\circ$).
- ② With the control lever positioned as described in ① above, adjust the plate's position so that the control lever plate and the dash pot push rod are in contact.



INJ. PUMP CALIBRATION DATA

TEST OIL:
ISO 4113 or
SAE J967d

ENGINE MODEL : 4FD1

BOSCH No. 9 460 610 353

DKKC No. 104749-5080

Date : 10, April 1989 0

Company : ISUZU

No. 894331 4661

For Test Condition see
Microfiche No. WP-210 (N-16)

1. Test Conditions

1-1 Nozzle : 105780-0000 (NP-DN12SD12T)	1-4 Injection pipe : 2 x 6 x 840 mm
1-2 Nozzle holder : 105780-2080 (EF8511/9)	1-5 Fuel oil temperature : 45 ¹⁵ °C
1-3 Nozzle opening pressure : 150 ¹⁵ kg/cm ²	1-6 Supply pump pressure : 0.2 kg/cm ²

2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1	Timing device travel	1,250	3.4 ~ 3.8 (mm)		
2-2	Supply pump pressure	1,250	4.6 ~ 5.0 (kg/cm ²)		
2-3	Full load delivery	1,250	35.3 ~ 36.3 (cc/1,000st)		3.0
2-4	Idle speed regulation	340	5.6 ~ 9.6 (cc/1,000st)		2.0
2-5	Start	100	50.0 ~ 70.0 (cc/1,000st)		
2-6	Full-load speed regulation	2,600	13.1 ~ 19.1 (cc/1,000st)		4.5
2-7					
2-8					
2-9					

3. Test Specifications

3-1 Timing device	N = rpm mm	1,250 3.3 ~ 3.9	2,000 6.3 ~ 7.5	2,500 8.6 ~ 9.4
3-2 Supply pump	N = rpm kg/cm ²	1,250 4.6 ~ 5.0	2,000 6.2 ~ 6.8	2,500 7.6 ~ 8.2
3-3 Overflow delivery	N = rpm cc/10s	1,250 55.0 ~ 98.0		

3-4 Fuel injection quantities

Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
Max. speed	1,250	34.8 ~ 36.8		
	600	28.8 ~ 32.8		
	2,250	31.2 ~ 35.4		
	2,600	12.6 ~ 19.6		
	2,900	Below 4.5		
Switch OFF Magnet valve	340	0		
Idling	340 450	5.6 ~ 9.6 0		
3-5 Solenoid	Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V			

4. Dimensions

K	3.2 ~ 3.4	mm
KF	5.7 ~ 5.9	mm
MS	1.5 ~ 1.7	mm
BCS	—	mm
Pre-stroke	0.23 ~ 0.27	mm

Control lever angle

α	-7° ~ 1°	deg
A	8.8 ~ 11.4	mm
β	32.0° ~ 42.0°	deg
B	10.2 ~ 13.5	mm
γ	—	deg
C	—	mm



DIESEL KIKI CO., LTD.

Service Department

3-6-7 SHIBUYA, SHIBUYA-KU, TOKYO 150, JAPAN

Tel. (03)5485-4135 Fax: (03)797-6069

INJ. PUMP CALIBRATION DATA

TEST OIL:
ISO 4113 or
SAE J967d

ENGINE MODEL: 4FD1

BOSCH No. 9 460 610 346
DKKC No. 104749-6661
Date: 10, April 1989
Company: ISUZU
No. 894468 5950

Injection pump No.: 104649-1721 [NP-VE4/9F2250RNP373]
Pump rotation: Clockwise-viewed from drive side

For Test Condition see
Microfiche No. WP-210 (N-16)

1. Test Conditions

1-1 Nozzle: 105780-0000 (NP-DN12SD12T)	1-4 Injection pipe: 2 x 6 x 840 mm
1-2 Nozzle holder: 105780-2080 (EF8511/9)	1-5 Fuel oil temperature: 45 ^{±5} °C
1-3 Nozzle opening pressure: 150 ^{±5} kg/cm ²	1-6 Supply pump pressure: 0.2 kg/cm ²

2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1 Timing device travel		1,250	3.4 ~ 3.8 (mm)		
2-2 Supply pump pressure		1,250	4.6 ~ 5.0 (kg/cm ²)		
2-3 Full load delivery		1,250	37.2 ~ 38.2 (cc/1,000st)		3.0
Full load delivery			(cc/1,000st)		
2-4 Idle speed regulation		340	5.6 ~ 9.6 (cc/1,000st)		2.0
2-5 Start		100	50.0 ~ 70.0 (cc/1,000st)		
2-6 Full-load speed regulation		2,600	13.1 ~ 19.1 (cc/1,000st)		4.5
2-7					
2-8					
2-9					

3. Test Specifications

3-1 Timing device	N = rpm mm	1,250 3.3 ~ 3.9	2,000 6.3 ~ 7.5	2,500 8.6 ~ 9.4
3-2 Supply pump	N = rpm kg/cm ²	1,250 4.6 ~ 5.0	2,000 6.2 ~ 6.3	2,500 7.6 ~ 8.2
3-3 Overflow delivery	N = rpm cc/10s	1,250 58.0 ~ 102.0		

3-4 Fuel injection quantities

Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
Max. speed	1,250	36.7 ~ 38.7		
	600	30.7 ~ 34.7		
	2,250	33.1 ~ 37.3		
	2,600	12.6 ~ 19.6		
	2,900	Below 4.5		
Switch OFF Magnet valve	340	0		
Idling	340 450	5.6 ~ 9.6 0		
3-5 Solenoid	Max. cut-in voltage: 12V, Test voltage:			

4. Dimensions

Control lever angle	
α	-2.0° ~ 6.0° deg
A	8.5 ~ 11.1 mm
β	40.0° ~ 50.0° deg
B	12.8 ~ 16.1 mm
γ	— deg
C	— mm

INJ. PUMP CALIBRATION DATA

TEST OIL:
IS 0 4113 or
SAE J967d

ENGINE MODEL : 4FD1

BOSCH No. 9 460 610 347

DKK No. 104749-6671

Date : 10, April 1989 0

Company : ISUZU

No. 894468 5960

For Test Condition see
Microfiche No. WP-210 (N-16)

1. Test Conditions

1-1 Nozzle : 105780-0000 (NP-DN12SD12T)
1-2 Nozzle holder : 105780-2080 (EF8511/9)
1-3 Nozzle opening pressure : 150⁻⁵ kg/cm²

1-4 Injection pipe : 2 x 6 x 840 mm
1-5 Fuel oil temperature : 45^{±5} °C
1-6 Supply pump pressure : 0.2 kg/cm²

2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1	Timing device travel	1,250	3.4 ~ 3.8 (mm)		
2-2	Supply pump pressure	1,250	4.6 ~ 5.0 (kg/cm ²)		
2-3	Full load delivery	1,250	37.2 ~ 38.2 (cc/1,000st)		3.0
	Full load delivery				(cc/1,000st)
2-4	Idle speed regulation	340	5.6 ~ 9.6 (cc/1,000st)		2.0
2-5	Start	100	50.0 ~ 70.0 (cc/1,000st)		
2-6	Full-load speed regulation	2,600	13.1 ~ 19.1 (cc/1,000st)		4.5
2-7					
2-8					
2-9					

3. Test Specifications

3-1 Timing device	N = rpm mm	1,250 3.3 ~ 3.9	2,000 6.3 ~ 7.5	2,500 8.6 ~ 9.4
3-2 Supply pump	N = rpm kg/cm ²	1,250 4.6 ~ 5.0	2,000 6.2 ~ 6.8	2,500 7.6 ~ 8.2
3-3 Overflow delivery	N = rpm cc/10s	1,250 58.0 ~ 102.0		

3-4 Fuel injection quantities

Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
Max. speed	1,250	36.7 ~ 38.7		
	600	30.7 ~ 34.7		
	2,250	33.1 ~ 37.3		
	2,600	12.6 ~ 19.6		
	2,900	Below 4.5		
Switch OFF Magnet valve	340	0		
Idling	340 450	5.6 ~ 9.6 0		
3-5 Solenoid	Max. cut-in voltage: 12V, Test voltage:			

4. Dimensions

K	3.2 ~ 3.4 mm
KF	5.7 ~ 5.9 mm
MS	1.5 ~ 1.7 mm
BCS	— mm
Pre-stroke	0.23 ~ 0.27 mm
Control lever angle	
α	-2.0° ~ 6.0° deg
A	8.5 ~ 11.1 mm
β	40.0° ~ 50.0° deg
B	12.8 ~ 16.1 mm
γ	— deg
C	— mm

INJ. PUMP CALIBRATION DATA

TEST OIL:
IS 0 4113 or
SAE J967d

ENGINE MODEL : 4FD1

BOSCH No. 9 460 610 348

DKKC No. 104749-6681

Date : 10, April 1989

Company : ISUZU

No. 894468 5970

For Test Condition see

Microfiche No. WP-210 (N-16)

Injection pump No.: 104649-1721 [NP-VE4/9F2250RNP373]
Pump rotation: Clockwise-viewed from drive side

1. Test Conditions

1-1 Nozzle : 105780-0000 (NP-DN12SD12T)	1-4 Injection pipe : 2 x 6 x 840 mm
1-2 Nozzle holder : 105780-2080 (EF8511/9)	1-5 Fuel oil temperature : 45 ^{±5} °C
1-3 Nozzle opening pressure : 150 ^{±5} kg/cm ²	1-6 Supply pump pressure : 0.2 kg/cm ²

2. Setting	Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1 Timing device travel	1,250	3.4 ~ 3.8 (mm)		
2-2 Supply pump pressure	1,250	4.6 ~ 5.0 (kg/cm ²)		
2-3 Full load delivery	1,250	35.3 ~ 36.3 (cc/1,000st)		3.0
2-4 Full load delivery		(cc/1,000st)		
2-5 Idle speed regulation	340	5.6 ~ 9.6 (cc/1,000st)		2.0
2-6 Start	100	50.0 ~ 70.0 (cc/1,000st)		
2-7 Full-load speed regulation	2,600	13.1 ~ 19.1 (cc/1,000st)		4.5
2-8				
2-9				

3. Test Specifications

3-1 Timing device	N = rpm mm	1,250 3.3 ~ 3.9	2,000 6.3 ~ 7.5	2,500 8.6 ~ 9.4
3-2 Supply pump	N = rpm kg/cm ²	1,250 4.6 ~ 5.0	2,000 6.2 ~ 6.8	2,500 7.6 ~ 8.2
3-3 Overflow delivery	N = rpm cc/10s	1,250 55.0 ~ 98.0		

3-4 Fuel injection quantities

Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
Max. speed	1,250	34.8 ~ 36.8		
	600	28.8 ~ 32.8		
	2,250	31.2 ~ 35.4		
	2,600	12.6 ~ 19.6		
	2,900	Below 4.5		
Switch OFF Magnet valve	340	0		
Idling	340 450	5.6 ~ 9.6 0		
3-5 Solenoid	Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V			

4. Dimensions

K	3.2 ~ 3.4	mm
KF	5.7 ~ 5.9	mm
MS	1.5 ~ 1.7	mm
BCS	—	mm
Pre-stroke	0.23 ~ 0.27	mm
Control lever angle		
α	-2.0° ~ 6.0°	deg
A	8.5 ~ 11.1	mm
β	40.0° ~ 50.0°	deg
B	12.8 ~ 16.1	mm
γ	—	deg
C	—	mm



DIESEL KIKI CO. LTD.

Service Department

3-6-7 SHIBUYA, SHIBUYA-KU, TOKYO 150, JAPAN

Tel. (03)5485-4135 · Fax: (03)797-6069

INJ. PUMP CALIBRATION DATA

TEST OIL:
ISO 4113 or
SAE J967d

ENGINE MODEL : 4FD1

BOSCH No. 9 460 610 349
DKKC No. 104749-6691
Date : 10, April 1989
Company : ISUZU
No. 894468 5980

Injection pump No.: 104649-1721 [NP-VE4/9F2250RNP373]
Pump rotation : Clockwise-viewed from drive side

For Test Condition see
Microfiche No. WP-210 (N-16)

1. Test Conditions

1-1 Nozzle : 105780-0000 (NP-DN12SD12T)	1-4 Injection pipe : 2 x 6 x 840 mm
1-2 Nozzle holder : 105780-2080 (EF8511/9)	1-5 Fuel oil temperature : 45 ^{±5} °C
1-3 Nozzle opening pressure : 150 ^{±5} kg/cm ²	1-6 Supply pump pressure : 0.2 kg/cm ²

2. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1 Timing device travel		1,250	3.4 ~ 3.8 (mm)		
2-2 Supply pump pressure		1,250	4.6 ~ 5.0 (kg/cm ²)		
2-3 Full load delivery		1,250	35.3 ~ 36.3 (cc/1,000st)		3.0
2-4 Full load delivery			(cc/1,000st)		
2-5 Idle speed regulation		340	5.6 ~ 9.6 (cc/1,000st)		2.0
2-6 Start		100	50.0 ~ 70.0 (cc/1,000st)		
2-7 Full-load speed regulation		2,600	13.1 ~ 19.1 (cc/1,000st)		4.5
2-8					
2-9					

3. Test Specifications				
3-1 Timing device	N = rpm mm	1,250 3.3 ~ 3.9	2,000 6.3 ~ 7.5	2,500 8.6 ~ 9.4
3-2 Supply pump	N = rpm kg/cm ²	1,250 4.6 ~ 5.0	2,000 6.2 ~ 6.8	2,500 7.6 ~ 8.2
3-3 Overflow delivery	N = rpm cc/10s	1,250 55.0 ~ 98.0		

3-4 Fuel injection quantities				
Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
Max. speed	1,250 600 2,250 2,600 2,900	34.8 ~ 36.8 28.8 ~ 32.6 31.2 ~ 35.4 12.6 ~ 19.6 Below 4.5		
Switch OFF Magnet valve	340	0		
Idling	340 450	5.6 ~ 9.6 0		
3-5 Solenoid	Max. cut-in voltage: 8V, Test voltage: 12 ~ 14V			

4. Dimensions				
K	3.2 ~ 3.4	mm		
KF	5.7 ~ 5.9	mm		
MS	1.5 ~ 1.7	mm		
BCS	—	mm		
Pre-stroke	0.23 ~ 0.27	mm		
Control lever angle				
α	-2.0° ~ +6.0°	deg		
A	8.5 ~ 11.1	mm		
β	40.0° ~ 50.0°	deg		
B	12.8 ~ 16.1	mm		
γ	—	deg		
C	—	mm		



DIESEL KIKI CO. LTD.

Service Department

3-6-7 SHIBUYA, SHIBUYA-KU, TOKYO 150, JAPAN

Tel. (03)5485-4135 · Fax: (03)797-6069

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Table of Contents (BOSCH No. → DKKC No.)

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